

## Progress Report 2017-4

**Prepared for:**  
Univar USA Inc.

**3950 NW Yeon Avenue  
Portland, Oregon**

January 2018

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Univar USA Inc.

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3950 NW Yeon Avenue  
Portland, Oregon

January 2018

Project No. 0436528



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## TABLE OF CONTENTS

<b>LIST OF FIGURES</b>	<i>ii</i>
<b>LIST OF TABLES</b>	<i>iii</i>
<b>1.0 INTRODUCTION</b>	<b>1</b>
<b>2.0 WORK PERFORMED DURING THE REPORTING PERIOD</b>	<b>2</b>
<b>2.1 Groundwater Monitoring</b>	<b>2</b>
2.1.1 Shallow Aquifer Hydraulic Conditions	3
2.1.2 Deep Aquifer Hydraulic Conditions	3
2.1.3 Hydrographs	3
2.1.4 Shallow Groundwater Monitoring Well Sampling Results	4
2.1.5 Deep and Gravel Groundwater Monitoring Well Sampling Results	5
2.1.6 DMW-7 Investigation	6
2.1.7 Recommendations	7
<b>2.2 ICM Activities</b>	<b>7</b>
2.2.1 Groundwater Extraction Well Performance	9
2.2.2 Water Treatment System Monitoring	11
2.2.3 SVE System Monitoring	12
2.2.4 Vapor Treatment System Monitoring	14
2.2.5 LNAPL Monitoring and Recovery Evaluation	15
2.2.6 DNAPL Monitoring	15
2.2.7 Mass Removal Summary	15
<b>2.3 NPDES Waste Discharge Permit</b>	<b>15</b>
<b>2.4 CMI Activities</b>	<b>16</b>
2.4.1 Corrective Action Alternative Development and Evaluation	16
2.4.2 Stormwater Source Control Evaluation	17
<b>3.0 CONTACT WITH AGENCIES</b>	<b>18</b>
<b>4.0 WORK PLANNED FOR THE NEXT REPORTING PERIOD</b>	<b>19</b>
<b>4.1 Groundwater Monitoring</b>	<b>19</b>
<b>4.2 ICM Activities</b>	<b>19</b>
<b>4.3 NPDES Waste Discharge Permit</b>	<b>19</b>

<b>4.4</b>	<i>CMI Activities</i>	<b>20</b>
<b>5.0</b>	<b>REFERENCES</b>	<b>21</b>
<b>6.0</b>	<i>Distribution List</i>	<b>24</b>

***APPENDIX A – TIME VS. CONCENTRATION TREND PLOTS - VOCs IN GROUNDWATER***

***APPENDIX B – INTERIM CORRECTIVE MEASURES MONITORING SUMMARY***

***APPENDIX C – LABORATORY ANALYTICAL DATA REPORTS AND DATA VALIDATION MEMORANDA***

***APPENDIX D – WELL LOGS***

***LIST OF FIGURES (immediately following text)***

- 1      *Site Location Map*
- 2      *Site Plan*
- 3      *ICM System Layout*
- 4      *Groundwater Monitoring Well Network*
- 5      *Shallow Aquifer Groundwater Conditions*
- 6      *Deep Aquifer Groundwater Conditions*
- 7      *Selected Monitoring Well Hydrographs (1995 – 2017)*
- 8      *Total cVOC Concentrations in Shallow Groundwater*
- 9      *Total Non-cVOC Concentrations in Shallow Groundwater*
- 10     *1,4-Dioxane and 1,1,1-TCA concentrations in Shallow Groundwater*

*LIST OF TABLES (immediately following figures)*

- 1      *Approved Groundwater Sampling Schedule*
- 2      *Well Coordinate Data and Groundwater Elevations*
- 3      *Groundwater Sampling Field Parameters*
- 4      *Groundwater Analytical Results (VOCs)*
- 5      *Groundwater Analytical Results (1,4-Dioxane Investigation)*

## **ACRONYMS AND ABBREVIATIONS**

°C	degrees Celsius
BTEX	Benzene, toluene, ethylbenzene, and xylene
CAA	Corrective Action Alternative
CAO	Corrective Action Objective
cDCE	cis-1,2-dichloroethene
cfm	cubic feet per minute
CMI	Corrective Measures Implementation
CMS	Corrective Measures Study
cVOCs	chlorinated VOCs
DCE	1,1-dichloroethene
ODEQ	Oregon Department of Environmental Quality
DMR	Discharge Monitoring Report
DNAPL	dense non-aqueous phase liquid
ERM	ERM-West, Inc.
ft	feet
gal	gallons
gpm	gallons per minute
ICM	Interim Corrective Measures
LNAPL	light non-aqueous phase liquid
mg/L	milligrams per liter
MW	monitoring well
mS/cm	millisiemens per centimeter
mV	millivolts
NAPL	non-aqueous phase liquid
ncVOCs	non-chlorinated VOCs
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
ORP	oxidation reduction potential
PCE	tetrachloroethene
PES	PES Environmental, Inc.
PID	photoionization detector

ppmv	parts per million by volume
RCRA	Resource Conservation and Recovery Act
SCM	site conceptual model
SVE	soil vapor extraction
TCA	1,1,1-trichloroethane
TCE	trichloroethene
Univar	Univar USA Inc.
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound
$\mu\text{g}/\text{L}$	micrograms per liter
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
VTS	vapor treatment system
WTS	water treatment system

## **1.0**

## **INTRODUCTION**

On behalf of Univar USA Inc. (Univar), ERM-West, Inc. (ERM) has prepared this quarterly progress report to present monitoring results and summarize activities performed at the Univar facility located at 3950 NW Yeon Avenue in Portland, Oregon (the “site”) (Figure 1). This progress report covers the period beginning 1 October 2017 through 31 December 2017 (Fourth Quarter 2017).

The site is an active chemical distribution facility and has been in operation since approximately 1947. The current site plan (Figure 2) has remained largely unchanged over the past 20 to 30 years. An Interim Corrective Measures (ICM) remediation system has been in place at the facility since 1989 and has been upgraded and expanded several times since then. The current ICM system layout (Figure 3) includes groundwater extraction wells and associated piping; soil vapor extraction (SVE) wells and associated piping; a treatment compound; and a light non-aqueous phase liquid (LNAPL) pilot test recovery system.

This report is being submitted in accordance with the Amendment to Administrative Order on Consent to Implement Corrective Action (RCRA Docket No. 1087-10-18-3008[h]) (the “Amended Order”) for the site dated 1 August 2007, between the U.S. Environmental Protection Agency (USEPA), Region 10 and Univar (USEPA 2007). The Consent Order was written in accordance with Section 3008(h) of the Resource Conservation and Recovery Act (RCRA). The Amended Order requires submittal of quarterly progress reports summarizing the Corrective Measures Implementation (CMI) activities underway at the site.

## **2.0**

### **WORK PERFORMED DURING THE REPORTING PERIOD**

The work performed during the reporting period included:

- Groundwater monitoring (including 1,4-dioxane sampling);
- DMW-7 Groundwater Investigation Work Plan activities;
- Operation and maintenance (O&M) of the ICM remediation system;
- National Pollutant Discharge Elimination System (NPDES) permit activities;
- NAPL monitoring; and
- CMI activities (stormwater pathway investigation).

These activities are described in detail below.

## **2.1**

### **GROUNDWATER MONITORING**

Groundwater monitoring activities were conducted during the reporting period per the approved schedule as shown in Table 1. Locations of groundwater monitoring wells, piezometers, and groundwater extraction wells appear on Figure 4.

Water levels from the majority of the monitoring well network were measured on 12 December 2017. Depth to water measurements and the corresponding groundwater elevation data are included in Table 2.

Groundwater samples were collected from semi-annual groundwater monitoring locations (Table 1) on 13 December through 15 December 2017 using standard low flow sampling techniques. Two monitoring wells (SMW-40 and DMW-8) were installed 23 – 24 October 2017 per the EPA-approved DMW-7 Groundwater Investigation Work Plan (ERM 2017b) (additional details provided in Section 2.1.6); these wells were sampled during the semi-annual monitoring event. Field parameters were measured immediately prior to analytical sample collection. All samples were analyzed for volatile organic compounds (VOCs). Eight wells (SMW-06, SMW-11, SMW-26, SMW-37, SMW-38, PZ-6, EXW-2, and EXW-3a) were analyzed for 1,4-dioxane in accordance with the EPA-approved scope of work, with the exception of collection of the water treatment system effluent sample (W-2) which could not be completed because the

ICM System was off for blower maintenance during monitoring (ERM 2017c).

The groundwater field parameter results are presented in Table 3. The analytical results for VOCs and 1,4-dioxane analyses are presented in Tables 4 and 5, respectively.

### **2.1.1    *Shallow Aquifer Hydraulic Conditions***

Figure 5 presents the groundwater elevation contours representing conditions in the shallow aquifer on 12 December 2017. As illustrated, the December 2017 conditions show a fairly flat groundwater elevation, or “table-top,” underlying the center of the site with the north and south areas generally flowing toward the north and south property boundaries, respectively. The groundwater elevations and flow directions are consistent with past conditions.

### **2.1.2    *Deep Aquifer Hydraulic Conditions***

Figure 6 presents the groundwater elevations representing conditions in the deep monitoring wells on 12 December 2017. Deep aquifer groundwater contours were developed using water table elevations from DMW-2a, DMW-3, DMW-6, and DMW-8. The December 2017 contours show a deep aquifer flow direction to the southwest; this represents a change from conditions observed since approximately November 2010 but is consistent with historical variations observed in the deep aquifer. Additionally, there is typically an upward gradient between the DMW-7 well (completed in the gravel zone) and the deep aquifer wells, but in December 2017, there was a downward gradient between the deep aquifer and the gravel zone. Hydraulic conditions within the deep aquifer will continue to be monitored on a quarterly schedule in accordance with the approved schedule as shown in Table 1.

### **2.1.3    *Hydrographs***

Groundwater elevation hydrographs for select shallow wells (SMW-5, SMW-7, SMW-8, SMW-11, and SMW-15) and select deep wells (DMW-2/2a) are shown on Figure 7 for 2011 through December 2017. These monitoring wells are generally outside of the ICM system’s area of

influence and were selected to represent the local seasonal groundwater table fluctuation. The figure also presents precipitation data and monthly average groundwater extraction pumping rates for the ICM system for this same period. In general, groundwater level fluctuations largely follow seasonal precipitation while pumping rates have remained stable since late 2008, except for periods of reduced flows due to maintenance requirements.

#### ***2.1.4 Shallow Groundwater Monitoring Well Sampling Results***

Groundwater field parameters were monitored during well purging, and are presented in Table 3. Groundwater parameter measurements are summarized below.

- Site pH ranged from 5.60 to 7.17 with an average of 6.65.
- Conductivity ranged from 0.070 millisiemens per centimeter (mS/cm) to 1.53 mS/cm.
- Groundwater temperature ranged from 11.30 degrees Celsius (°C) to 15.49 °C with an average of 14.13 °C.
- Oxidation reduction potential (ORP) ranged from -110.50 millivolts (mV) to 64.90 mV indicating a moderately reducing environment.
- Dissolved oxygen measurements ranged from 0.42 milligrams per liter (mg/L) to 5.64 mg/L, with a median value of 0.80 mg/L. Less than 10% of readings (PZ-12 and EXW-3a) are greater than 1.20 mg/L, indicating a generally anaerobic environment.

Groundwater VOC concentrations from samples collected from the shallow groundwater monitoring wells in November and December 2017 are summarized in Table 4. Figures 8 and 9 present chlorinated VOC (cVOC) and non-chlorinated VOC (ncVOC) concentrations, respectively. Groundwater 1,4-dioxane concentrations from samples collected in December 2017 are included in Table 5 and presented on Figure 10. Copies of laboratory analytical data reports are included in Appendix C. The results for samples collected in November and December 2017 are summarized as follows:

## VOCs

- Total VOC concentrations ranged from non-detect to 181,870 micrograms per liter ( $\mu\text{g}/\text{L}$ ). The highest concentration was observed in SMW-07.
- The total VOC concentration at the shallow groundwater monitoring well SMW-09 was observed at 1,412  $\mu\text{g}/\text{L}$ ; this represents an increase relative to sample results in June 2017 of 27  $\mu\text{g}/\text{L}$ .
- The total VOC concentration at the shallow groundwater monitoring well SMW-40 were observed at 5,962  $\mu\text{g}/\text{L}$  in November 2017; this represents an increase relative to sample results collected as part of the DMW-7 Groundwater Investigation of 162  $\mu\text{g}/\text{L}$  in December 2017.
- The VOC concentrations detected at EXW-3a and in nearby shallow monitoring wells indicate the combination of extraction well capture, low hydraulic gradients, and natural attenuation are preventing off-site migration of dissolved VOCs in the northern side of the facility.

## 1,4-Dioxane

- Concentrations of 1,4-dioxane ranged from 1.2  $\mu\text{g}/\text{L}$  to 88.0  $\mu\text{g}/\text{L}$ , with the exception of one detection of 1,250  $\mu\text{g}/\text{L}$  (piezometer PZ-6).
- The 1,4-dioxane concentrations detected at EXW-2 and EXW-3a were 19.6  $\mu\text{g}/\text{L}$  and 1.2  $\mu\text{g}/\text{L}$ , respectively.
- All groundwater results for 1,4-dioxane were below the most conservative ODEQ Risk-Based Concentration (RBC) for 1,4-dioxane for applicable exposure pathways at the site of 3,400  $\mu\text{g}/\text{L}$  (Groundwater in Excavation RBC).

The laboratory analytical data were validated consistent with the Data Collection Quality Assurance Plan (HLA 1989). Data qualifiers, when warranted, are presented in the analytical summary tables. All data were judged usable for their intended purpose. Data validation memoranda are presented in Appendix C, following the laboratory analytical data reports.

### **2.1.5 Deep and Gravel Groundwater Monitoring Well Sampling Results**

DMW-7 (Gravel Zone) and DMW-8 (Deep Zone) were sampled as part of the DMW-7 Groundwater Investigation (ERM 2017b) in November 2017 (additional details provided in Section 2.1.6). DMW-8 was also sampled with the routine groundwater monitoring in December 2017. Results are summarized as follows:

- The VOC concentrations at DMW-8 were observed to be consistent with results collected as part of the DMW-7 Groundwater Investigation at 222 µg/L and 184 µg/L in November and December 2017, respectively.
- The VOC concentration at DMW-7 was observed at 140 µg/L in November 2017.
- The total VOC concentration in DMW-7 decreased relative to sample results in May 2016 and May 2017 of 4,880 µg/L and 3,271 µg/L respectively.
- The November 2017 total VOC concentration in DMW-7 is consistent with historical total chlorinated hydrocarbons concentrations, prior to the anomalous May 2016 result.

## **2.1.6      *DMW-7 Investigation***

The USEPA approved DMW-7 Groundwater Investigation Work Plan was initiated in the Fourth Quarter 2017 (ERM 2017b). Activities completed during the fourth quarter 2017 are summarized as follows:

- SMW-40 and DMW-8 were installed between 23 October and 24 October 2017 per the EPA-approved DMW-7 Groundwater Investigation Work Plan (well logs are provided in Appendix D).
- ERM conducted a short-term step pump test at DMW-7 on 31 October 2017 to determine the appropriate pumping rate for an 8-hour constant pump test.
- The results of the pump test indicated that DMW-7 could produce much more volume than originally anticipated in the DMW-7 Groundwater Investigation Work (i.e., greater than 10 gpm available, instead of the anticipated approximate 4 gpm).
- Before implementing a higher rate pump test, ERM collected samples from SMW-40, DMW-7, and DMW-8 in November 2017 for VOC analysis to evaluate potential relationships between aquifers (see Table 4).

- Groundwater concentrations of VOCs in SMW-40, DMW-7, and DMW-8 in November 2017 were of similar composition and magnitude between the three wells (Table 4).
- Total VOC concentrations at the shallow groundwater monitoring well SMW-40 were 162 µg/L and 5,962 µg/L in November and December 2017, respectively.
- The total VOC concentration in DMW-7 in November 2017 (140 µg/L) decreased significantly relative to sample results in May 2017 of 3,271 µg/L.

## **2.1.7      *Recommendations***

Based on the VOC concentrations detected at SMW-11, PZ-6, and EXW-3a, the combination of low hydraulic gradients, groundwater flow direction, and natural attenuation is preventing off site migration of the dissolved plume on the northern side of the facility. Based on current observations, ERM recommends continuing the current interim monitoring program throughout 2018 under the schedule presented in Table 1 (approved by the USEPA on 14 November 2012) for verification of hydraulic capture.

ERM recommends collecting samples from SMW-40, DMW-7, and DMW-8 for VOC analysis in the First Quarter 2018 as part of the on-going DMW-7 Investigation to confirm VOC concentrations observed in the Fourth Quarter 2017. The DMW-7 Groundwater Investigation Memorandum will be completed following results of these analyses.

## **2.2            *ICM ACTIVITIES***

Operation of the ICM groundwater extraction, SVE, and treatment systems continued during the reporting period. Monitoring and sampling information documenting the performance of the ICM is included in Appendix B. Routine monitoring and sampling was conducted per the approved schedule (PES 2011c) summarized in Table B1. Figure 3 illustrates the current ICM system layout and includes groundwater extraction wells, SVE wells, groundwater and SVE conveyance piping, and a treatment building.

The groundwater extraction system did not operate from the beginning of the reporting period (1 October 2017) until 23 October 2017 while changes were made to the PLC programming. During the reporting period, the ICM remediation system generally operated continuously with some shutdown periods for maintenance activities and upgrades to system control features. The mechanical, electrical, and control systems generally functioned as designed, except for a faulty high-high water alarm at the air stripper and automatic system shutdown on 4 December 2017. The faulty alarm was investigated and the PLC programming updated accordingly. When the system was restarted on 8 December 2017, the SVE system blower was not operating correctly. The system was shut down and remained off while the blower was sent offsite for maintenance. The system was restarted on 28 December 2017. Routine maintenance was completed for groundwater extraction conveyance lines (i.e., line jetting) and the blower motor was replaced during the reporting period. EXW-2 is functioning properly; however, EXW-3a is currently down for additional programming and is expected to be brought online in First Quarter 2018.

Highlights of the major activities and overall ICM performance are summarized below, with additional details provided in the following sections:

- The ICM system was monitored, maintained, and sampled in accordance with the schedule in Table B1.
  - Routine maintenance tasks included maintenance of the SVE & WTS blower, cleaning air stripper trays, cleaning filters, oil changes, motor drive belt adjustments, SVE condensate management, change-out of primary carbon vessels, and extraction well maintenance.
  - Line jetting was completed to remove fouling within groundwater extraction conveyance lines.
  - Blower alignment and motor mount were rebuilt.
  - The SVE blower failed 8 December 2017 and, after on-site repair attempts, was sent off-site for repairs 11 December 2017.
  - Upgrades to the ICM system and PLC were completed including process controls, such as alarms designed to detect changed or improper conditions, provide operators real-time notifications of health and safety issues, and continuous recording of system parameters.

- Select daily and weekly monitoring data from the groundwater extraction, SVE, and vapor treatment systems are summarized in Table B2.
- ICM activities have removed an estimated total of 40.7 pounds of VOCs during the reporting period from operation of the groundwater extraction system (0.9 pounds) and SVE system (39.8 pounds). The ICM activities have removed an estimated total of 28,886 pounds of VOCs over the entire operating period (dating back to 1992). Table B9 and Charts B5 and B6 summarize the quarterly and historical VOC mass removal of ICM activities.

All laboratory analytical data for the media sampled as part of ICM monitoring have been validated consistent with the Data Collection Quality Assurance Plan (HLA 1989). All data presented were judged usable for their intended purpose. Electronic copies of laboratory analytical data reports and data validation memoranda are included in Appendix C.

## 2.2.1

### *Groundwater Extraction Well Performance*

The ICM groundwater extraction system currently includes operating extraction well EXW-2 (located at the southeast corner of the property) and EXW-3a (located near the northwest corner of the property) and associated conveyance piping (Figure 3).

Activities completed during the reporting period included extraction well monitoring, extraction well sampling, and upgrades to the PLC system. The capture zone could not be evaluated Fourth Quarter 2017 as the ICM groundwater extraction system was down for maintenance during groundwater monitoring.

### *Groundwater Extraction Well Monitoring*

Groundwater extraction wells are monitored a minimum of two times per month for groundwater pumping rate, water level, and routine maintenance parameters. Pumping rates of the two operating extraction wells over the course of the reporting period are presented on Table B2 and summarized below:

- EXW-2 operated at its target pumping rate of approximately 6 gallons per minute (gpm) in October 2017. The pump rate decreased to 5.3

gpm in November and 5.0 gpm in December 2017. The decrease in flow rate can be attributed to line fouling.

- EXW-3a did not operate during the reporting period. Troubleshooting is ongoing.

#### *Groundwater Extraction Well Sampling*

Quarterly performance water quality samples were collected from extraction wells EXW-2 and EXW-3a on 14 and 15 December 2017 and analyzed for VOCs by USEPA Method 8260b; results are summarized in Table B3. The extraction wells were not operating during sample collection due to the system being offline. Individual target VOCs are included on time versus concentration trend plots in Appendix A, and total VOC concentrations are plotted on Chart B1.

Total VOC concentrations detected in both extraction wells show an overall general decline since 2002 (Chart B1). The historical trend plots for EXW-2 and EXW-3a (Appendix A) display similarly declining concentration trends in PCE, TCE, and degradation compounds, although EXW-2 shows much lower concentrations than EXW-3a, with PCE and TCE concentrations near or below detection levels beginning in 2012. By contrast, degradation compounds cDCE and vinyl chloride show an increasing trend, which are likely attributable to natural degradation of parent compounds PCE and TCE. The historical trend plots for TCA (and degradation compounds), methylene chloride, and toluene show very similar decreasing concentration trends in both extraction wells. These compounds were largely non-detect, indicating the extraction wells are drawing contaminated groundwater from the edge of the plume.

#### *Groundwater Capture Zone Evaluation*

Groundwater level monitoring of the entire well network was conducted on 12 December 2017 to document groundwater conditions in the shallow and deep aquifers at the site. The groundwater extraction system was down for maintenance during this time. Figure 5 illustrates groundwater elevation contours in the shallow aquifer on 12 December 2017. A summary of the groundwater monitoring observations with respect to containment of VOCs onsite, in the vicinity of extraction wells, is provided as follows:

- VOCs at EXW-2 were below CULs, with the exception of TCE and VC. EXW-2 has been restarted since these data were collected.

- VOCs at EXW-3a were below CULs and largely non-detect. Groundwater monitoring results from downgradient monitoring wells; including PZ-6 and SMW-11 indicate contaminants are not migrating offsite at concentrations above CULs on the northern side of the facility.

#### *Recommendations*

Declining groundwater extraction rates as well as fluctuations in VOC concentrations in monitoring wells downgradient of EXW-3a (SMW-11, SMW-26, and PZ-6) indicate reduced performance of EXW-3a. To achieve groundwater capture in this area of the site, a supplemental extraction well, or wells, will be utilized.

To determine whether the target capture boundary (defined in 2003) allows for adequate containment, an assessment of the current VOC plume extent in the shallow aquifer with respect to the site cleanup levels has been completed. The results of this assessment were reported in the Capture Boundary Assessment and Groundwater Extraction Evaluation report (ERM 2016). This report recommended revising the groundwater extraction program to transition from extraction wells EXW-2 and EXW-3a and replacing with the extraction wells EXW-1 and EXW-5a. Based on USEPA comments on the Capture Boundary Assessment and Groundwater Extraction Evaluation report, an ICM System Modification Request is being prepared.

#### 2.2.2

#### *Water Treatment System Monitoring*

The ICM water treatment system (WTS) is monitored daily for pH, temperature, and flow volume total, and weekly for O&M parameters. The NPDES wastewater discharge permit No. 101613 (ODEQ 2010) requires daily pH and flow monitoring, and monthly sampling of the WTS effluent (sample point W-2). Influent samples (sample point W-1) are also collected monthly to evaluate WTS treatment performance. Sampling points W-1 and W-2 are located in the ICM treatment system building (Figure 3). Influent and effluent samples are analyzed for VOCs (by USEPA Method 8260C) and the results used to determine mass removal rates and assess treatment system performance. The monthly effluent samples are also analyzed for cyanide (by SM 4500-CN-E), oil, and grease (by USEPA Method 1664). A summary of the WTS monitoring is below:

- The WTS was shut down for maintenance (PLC upgrades and programming) until 23 October 2017. October runtime was 208.1 hours of operation. November 2017 runtime was 720 hours of operation. The WTS was shut down to perform blower maintenance on 8 December 2017 and brought back online 28 December 2017, resulting in 150.2 hours of operation. When the system was brought back online on 28 December 2017, the PLC system failed to resume data recording, and pH measurements were not collected 28, 30, and 31 December 2017. No permit limits were exceeded, as all alarms and shutdown systems remained fully operational. The WTS ran for a total of 1,078.3 hours (out of a possible 2,208 hours; 49 percent) during the reporting period.
- The WTS processed approximately 350,000 gallons (gal) of water during the reporting period. The air stripper removed an average of 99 percent of VOCs during the reporting period.
- WTS samples were collected on 24 October, 9 November, and 29 December 2017. Sample results are summarized in Table B4 and Chart B2. There were no permit limit exceedances during the reporting period, although pH readings were not collected on 28, 30, or 31 December 2017. There were no system alarms or shutdowns during this time. The ODEQ was notified by telephone on 12 January 2018 (personal communication Mike Pinney), and in the December 2017 DMR, that was submitted to the ODEQ on 15 January 2018.
- WTS influent concentrations have been consistently trending downward since ICM groundwater extraction came online in 2002 (Chart B2).
- The ICM groundwater extraction system removed an estimated 0.9 pounds of VOCs during the reporting period (Table B9).

## 2.2.3

### *SVE System Monitoring*

The ICM SVE system includes eight SVE wells (SG-2a through SG-9) and associated conveyance piping; the system layout is illustrated in Figure 3. The SVE system operated throughout the entire reporting period with downtime for routine maintenance activities and system upgrades described above. Activities completed during the reporting period included SVE well monitoring, SVE well field balancing, and vapor sampling.

The SVE system performance is monitored once per month at each of the operating SVE wells, and once per week at the air stripper discharge point (VSP-1) and combined SVE sample point (VSP-2; where SVE well and air stripper vapors combine prior to treatment) using a photoionization detector (PID), a magnehelic pressure gauge, and a velocity meter. Sampling points VSP-1 and VSP-2 are located in the ICM treatment system building (Figure 3). SVE performance samples are collected monthly from sample point VSP-2 and quarterly from the newer SVE wells (SG-7 through SG-9). Performance samples are analyzed for VOCs by USEPA Method TO-15. A summary of the SVE system monitoring is below:

- Field PID readings for the combined SVE vapor stream (VSP-2) ranged 8.7 to 11.9 parts per million by volume (ppmv); Table B2 presents the weekly SVE system monitoring data. The total SVE flow rate at VSP-2 varied between 128 and 208 cubic feet per minute (cfm) during the reporting period.
- SVE well readings were monitored for potential adjustment to shift extraction velocities and vacuum to wells with higher vapor VOC concentrations to increase vapor mass removal. A summary of SVE well field monitoring data is included in Table B5.
- SVE system performance samples were collected from VSP-2 on 24 October, 9 November, and 29 December 2017. SVE wells SG-7, SG-8, and SG-9 were sampled on 9 November 2017. Sample results are summarized in Table B6 and Chart B3.
- Total VOCs detected at VSP-2 increased in October compared to Third Quarter 2017 and decreased in November and December. Seasonally increasing groundwater elevations in November and December likely caused a decrease in vadose zone soil thickness available for vapor extraction.
- The ICM SVE system removed an estimated 39.8 pounds of VOCs during the reporting period, as shown in Table B9.

#### *Recommendations*

Soil vapor extraction field data indicates the need to complete well field balancing to increase the number of extraction wells contributing to total flow from the SVE system to increase the amount of VOCs removed. To achieve optimal mass removal from the SVE system well field balancing will be completed as deemed appropriate according to performance data in First Quarter 2018.

## 2.2.4

### *Vapor Treatment System Monitoring*

The ICM vapor treatment system (VTS) performance is monitored weekly using a PID, with vapor samples collected for laboratory analysis at least once per reporting period. The field monitoring data is used to track VTS performance and to determine when additional VTS samples should be collected for laboratory analysis. The weekly field monitoring data are presented in Table B2.

The current practice is to collect VTS samples when at least one of the following conditions occurs:

- The 5-day average field PID treatment efficiency reaches approximately 95 percent (PES 2007);
- The linear projection of the treatment efficiency curve (from a previous performance sample) reaches 92 percent (PES 2007);
- Quarterly (PES 2011c); and/or
- Breakthrough at or above 75 percent of the primary vessels.

The VTS operated throughout the reporting period with downtime in October for routine maintenance and system upgrades, and in December for equipment repairs.

Carbon Cycle No. 51 started on 27 September 2017 with change-out of the secondary carbon vessels, and remained in operation through the reporting period. A summary of the VTS monitoring is below:

- VTS performance samples were collected on 9 November 2017. The vapor samples were analyzed for VOCs by USEPA Method TO-15. Four samples were collected during the sampling event: one each from the VTS influent vapor stream (VSP-3b), VTS midpoints (VSP-4a and VSP-4b), and from the stack effluent (VSP-5); the sample results are summarized in Table B7.
- VTS performance samples collected on 9 November 2017 indicate that the system operated at an estimated 97 percent treatment efficiency throughout Carbon Cycle 51. Chart B4 shows the VTS performance numerically and graphically.
- Linear projection of VTS performance samples collected on 9 November 2017 indicate treatment efficiency will reach 92 percent at the end of January 2018; accordingly, VTS performance samples will be collected in February 2018.

## **2.2.5**

### ***LNAPL Monitoring and Recovery Evaluation***

Activities conducted during the reporting period included LNAPL monitoring consistent with approved work plans (PES 2008b, 2008c, 2011a, 2012a) and the modified LNAPL monitoring schedule in the EPA-approved *Request to Modify LNAPL Monitoring Schedule* (ERM 2017a). LNAPL was detected at SG-6 (0.01 ft) and RW-3 (0.03 ft) on 12 December 2017. Table B8 summarizes the LNAPL monitoring completed during the reporting period. No LNAPL was recovered during the reporting period.

## **2.2.6**

### ***DNAPL Monitoring***

Dense non-aqueous phase liquid (DNAPL) monitoring was conducted on 12 August 2017 in shallow monitoring wells SMW-37 and SMW-38 consistent with the recommendations provided in the DNAPL Investigation Summary (PES 2011d). DNAPL was observed in monitoring well SMW-37 (0.58 ft) and SMW-38 (dispersed globules detected between 15 – 20 ft below top of casing) during the reporting period; this is the first observation of DNAPL since 2013 but is consistent with historical observations.

## **2.2.7**

### ***Mass Removal Summary***

During the reporting period, ICM activities removed an estimated total of 40.7 pounds of VOCs from operation of the groundwater extraction system and SVE system. Table B9 presents the ICM mass removal information for the reporting period and over the entire operating period (dating back to 1992).

The estimated total mass removed by ICM activities since 1992 is 28,886 pounds of VOCs. Charts B5 and B6 summarize the quarterly and historical VOC mass removal efforts. As is evident based on the information summarized above and in the charts, the majority of VOC mass is removed by the SVE system.

## **2.3**

### ***NPDES WASTE DISCHARGE PERMIT***

The NPDES permit renewal application was submitted to the Oregon Department of Environmental Quality (ODEQ) on 3 April 2014 along with

the data required to support a Reasonable Potential Analysis for arsenic. Arsenic monitoring data was provided to the agency and a preliminary evaluation indicated no reasonable potential to increase arsenic concentrations in the receiving water body; thus, it is unlikely limits for arsenic will be added with renewal of the permit. At the time of preparation of this report, the NPDES permit renewal application was still under review by the ODEQ.

## 2.4

### **CMI ACTIVITIES**

CMI activities during the reporting period included continuing steps in development and evaluation of CAAs consistent with the approved CMI Work Plan Addendum (PES 2010b).

The CMI Work Plan Addendum updated the CMI scope of work to include a new component: Task 6 - Reevaluation of Source Area Technologies and Corrective Action Alternatives. A summary of the major elements currently in progress appears below:

- Subtask 6.3 (Cleanup Action Alternative Development and Evaluation) has been initiated; current activities related to this subtask are summarized in Section 2.4.1.
- Subtask 6.4 (Supplemental Corrective Measures Study Report) will begin once Subtask 6.3 has been completed.

#### 2.4.1

#### *Corrective Action Alternative Development and Evaluation*

The available site conceptual model (SCM) information has been reviewed and presented in the Revised Site Geologic Model (ERM 2015a). This information was originally presented in the Final Draft Corrective Measures Study (CMS) Report (PES 2006), and more recent design investigation data was presented in the Draft Engineering Design Report (PES 2009) Appendix B (Design Investigation Summary Report, 2005 through 2009, Corrective Measures Implementation) and the DNAPL Investigation Summary (PES 2011d). The updated SCM will be used to develop a range of preliminary CAAs that can efficiently remediate NAPL, soil and groundwater contamination, and address the updated corrective action objectives (CAOs). Univar reviewed the preliminary list of CAAs with USEPA during the Optimization meeting on 19 January 2017. The Final Optimization Review Report was provided by USEPA on

20 June 2017, which confirmed the preliminary list of CAAs with the recommendation that low temperature thermally enhanced bioremediation be included as a CAA.

## 2.4.2

### *Stormwater Source Control Evaluation*

Univar submitted the Final SWSCE Work Plan (ERM 2015b) on 10 December 2015 in accordance with the Letter Agreement, dated 24 July 2015, between Univar and the ODEQ to investigate the stormwater pathway and implement stormwater source control measures under ODEQ's Voluntary Cleanup Program. This work is being conducted to evaluate whether actual or potential sources of constituents of concern pose an environmental risk to the Portland Harbor Superfund study area of the Willamette River via potential stormwater pathway or through groundwater in or along utility conveyance features that discharge to the Willamette River.

The Final SWSCE Work Plan was approved on 11 December 2015 and implementation of the scope of work is complete. The four required stormwater sampling events have been conducted and the Draft SWSCE was submitted to ODEQ in September 2017. Univar received ODEQ comments on the Draft SWSCE on 3 October 2017 and submitted a response to comments and Final SWSCE on 3 November 2017. The ODEQ approved the Final SWSCE on 6 November 2017. In accordance with the ODEQ approved Final SWSCE, ERM submitted the Source Control Measure (SCM) Work Plan on 21 December 2017 to detail proposed source tracing and the implementation of SCMs to achieve a source control decision in 2018.

The USEPA submitted comments on the Final SWSCE on 21 December 2017. ODEQ asked Univar to wait for further instruction prior to developing a response to comments received from USEPA. Univar anticipates receiving comments from ODEQ on the SCM Work Plan in the First Quarter 2018.

### **3.0**

### **CONTACT WITH AGENCIES**

- On 2 October 2017 ERM emailed USEPA to provide the September 2017 summary report and monthly progress call agenda.
- On 3 October 2017 USEPA/ERM held a monthly progress meeting in Portland, OR.
- On 30 October 2017 ERM emailed USEPA to provide the 3<sup>rd</sup> Quarter 2017 Progress Report.
- On 31 October 2017 USEPA emailed ERM to request the status of the DMW-7 Groundwater Investigation Activities.
- On 1 November 2017 ERM emailed USEPA to provide an update on the status of the DMW-7 Groundwater Investigation Activities.
- On 9 November 2017 USEPA emailed ERM to request hard copies of the Final Stormwater Source Control Evaluation.
- On 13 November 2017 ERM emailed USEPA to provide a proposed scope for 1,4-Dioxane sampling.
- On 16 November 2017 USEPA emailed ERM to provide comments on the proposed scope for 1,4-Dioxane sampling.
- On 1 December 2017 ERM emailed USEPA to provide a response to comments on the proposed scope for 1,4-Dioxane sampling.
- On 5 December 2017 USEPA/ERM held a monthly progress meeting in Portland, OR.
- On 21 December 2017 ERM emailed USEPA to provide the Draft Source Control Measure Work Plan.
- On 21 December 2017 USEPA emailed Univar to provide comments on the Final Stormwater Source Control Evaluation.

## **4.0 WORK PLANNED FOR THE NEXT REPORTING PERIOD**

### **4.1 GROUNDWATER MONITORING**

Conduct First Quarter 2018 groundwater monitoring activities in January 2018 consistent with Table 1: Approved Groundwater Sampling Schedule. A summary of the planned tasks is below:

- Quarterly water level monitoring to support evaluation of the ICM groundwater extraction system;
- Collect quarterly groundwater samples from the operating groundwater extraction wells as part of routine O&M;
- Collect groundwater samples from shallow and deep monitoring wells as per the approved schedule for continued assessment of the performance and effectiveness of the ICM system's groundwater extraction;
- Collect groundwater samples as part of the DMW-7 Groundwater Investigation from SMW-40, DMW-7, and DMW-8; and
- Collect a 1,4-dioxane sample from the water treatment system discharge location (W-2) to complete the sampling in accordance with the proposed scope for 1,4-dioxane sampling (ERM 2017c).

### **4.2 ICM ACTIVITIES**

- Perform routine O&M and monitoring of the ICM system consistent with Table B1: Approved ICM Monitoring and Sampling Schedule;
- Complete SVE well extraction flow balancing upon collection and evaluation of the monthly SVE system field parameter measurements to increase vapor mass removal;
- Complete LNAPL monitoring on a quarterly basis; and
- Continue DNAPL monitoring on a quarterly basis.

### **4.3 NPDES WASTE DISCHARGE PERMIT**

- Continue to implement WTS sampling as per Table B1: Approved ICM Monitoring and Sampling Schedule; and submit the required monthly

Discharge Monitoring Reports (DMRs) to the NPDES permit writer (ODEQ).

#### **4.4**

#### ***CMI ACTIVITIES***

- Complete investigations to evaluate observations of elevated VOCs at DMW-7; and
- Continue development and evaluation of a range of CAAs that address the updated CAOs per the approved scope of work identified in the CMI Work Plan Addendum (PES 2010b).

## 5.0

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- PES. 2012a. *Request to Modify LNAPL Monitoring Scope*, Univar USA Inc., Portland, Oregon, ORD 009227398. May 29.
- PES. 2012b. *Draft Stormwater Pathway Investigation Report*, Univar USA Inc., 3950 NW Yeon Avenue, Portland, Oregon. August 21.
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**Progress Report 2017-4**

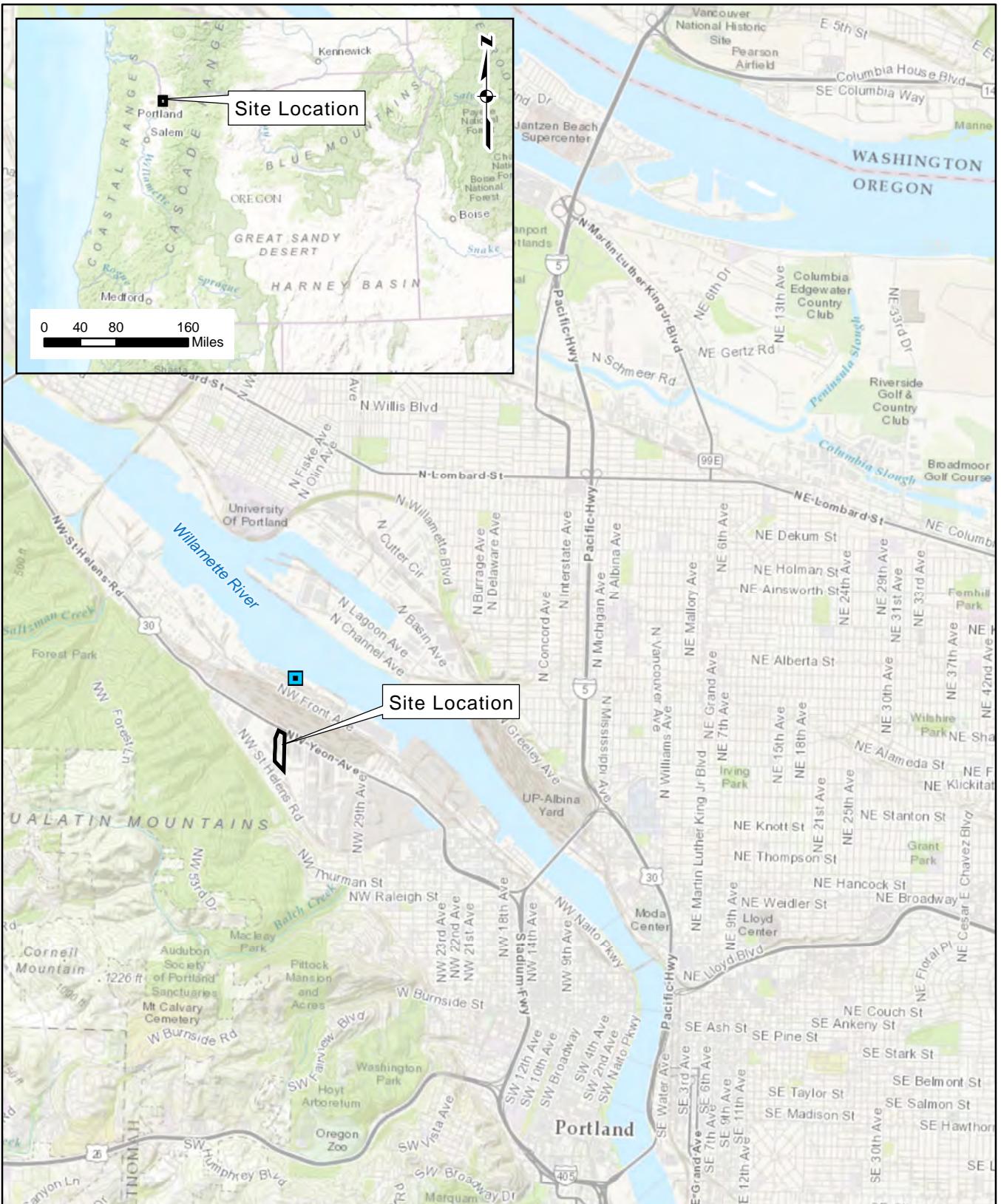
**Univar USA, Inc.  
3950 NW Yeon Avenue  
Portland, Oregon**

**January 2018**

**COPY NO. \_\_\_\_\_**

		<u>Copy No.</u>
<b>2 Copies</b>	<b>U.S. Environmental Protection Agency</b>	<b>1-2</b>
<b>1 e-Copy</b>	Region 10 Office 1200 6th Avenue Seattle, Washington 98101	
	Attention: Ms. Laura Castrilli	
<b>1 Copy</b>	<b>U.S. Environmental Protection Agency</b>	<b>3</b>
<b>1 e-Copy</b>	Region 10 Office 1200 6th Avenue Seattle, Washington 98101	
	Attention: Mr. Timothy Maley	
<b>1 e-Copy</b>	<b>Univar USA Inc.</b> 17425 NE Union Hill Road Redmond, WA 98052	<b>N/A</b>
	Attention: Mr. Mark Metcalf	
<b>1 Copy</b>	<b>Univar USA Inc.</b>	<b>4</b>
<b>1 e-Copy</b>	3950 NW Yeon Avenue Portland, OR 97210-1412	
	Attention: Mr. Luke Faircloth	
<b>1 Copy</b>	<b>Oregon Department of Environmental Quality</b>	<b>5</b>
<b>1 e-Copy</b>	Northwest Region 700 NE Multnomah St. (700 Lloyd Building), Suite #600 Portland, OR 97232	
	Attention: Mr. Matt McClincy	
<b>1 Copy</b>	<b>ERM Project File</b>	<b>N/A</b>

## *Figures*

**Legend**

Outfall 18

Approximate Univar Property Boundary

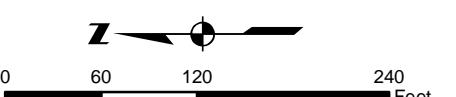
0 0.5 1 2 Miles

**Figure 1**  
**Site Location Map**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**



### Legend

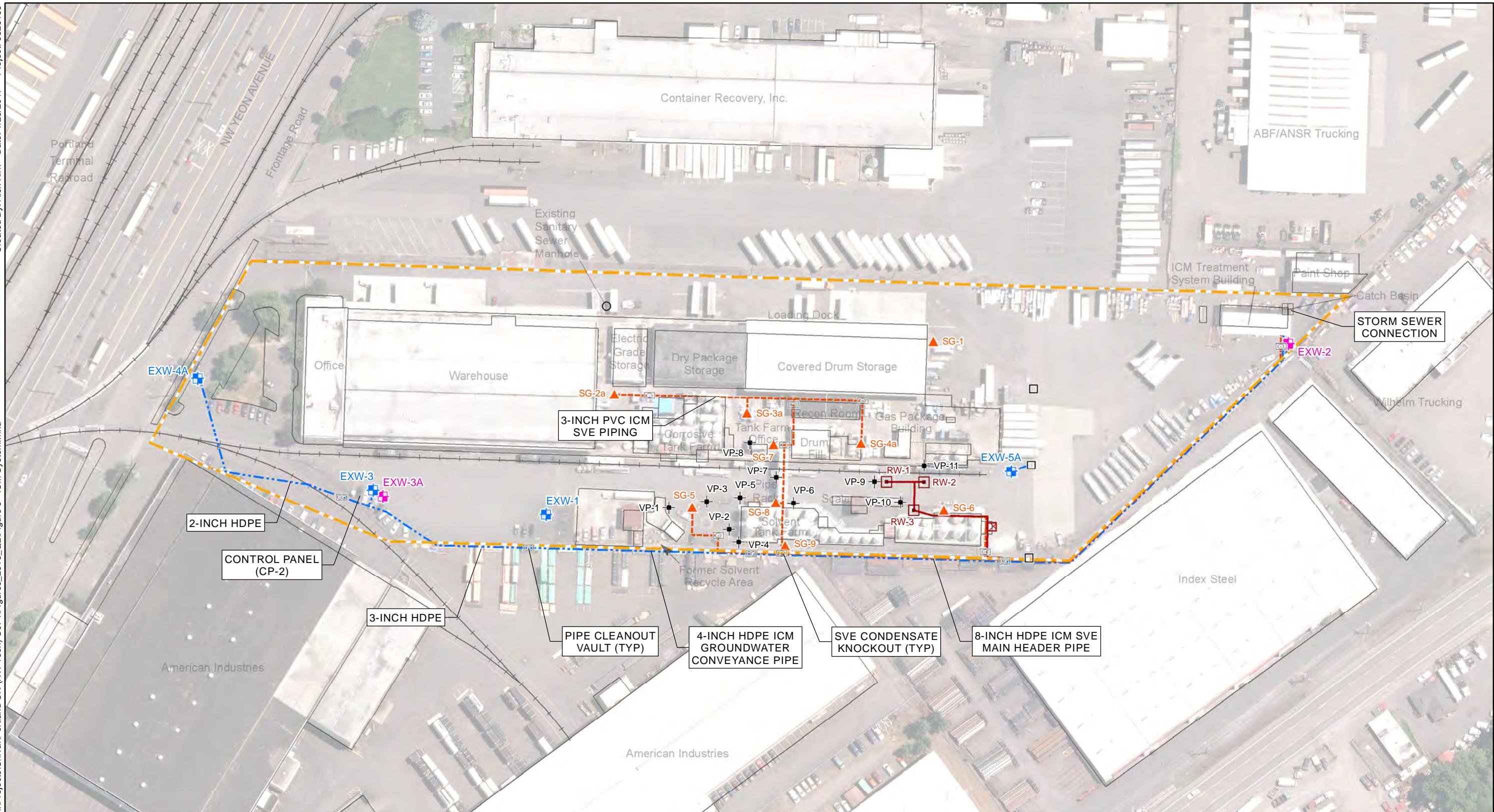
- Railroad Track
- Approximate Univar Property Boundary



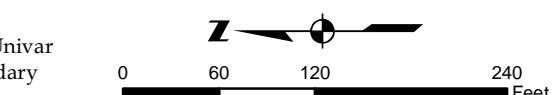
Aerial Image - USGS State Orthoimagery, July 2012, 0.5 ft per pixel.

**Figure 2**  
**Site Plan**

**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**

**Legend**

- Active Extraction Well
- Inactive Extraction Well
- ▲ SVE Well
- LNAPL Pilot Test Well
- Vapor Monitoring Probe
- SVE Condensate Sump
- Pipe Cleanout Vault
- Pipe Junction Vault
- LNAPL Pilot Test Piping
- Groundwater Conveyance Pipe
- SVE Conveyance Pipe
- Railroad Track
- Approximate Univar Property Boundary
- LNAPL Recovery Equipment Pad



Aerial Image - USGS State Orthoimagery, July 2012, 0.5 ft per pixel.

**Notes:**

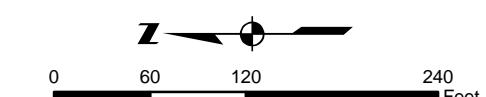
- Connection to storm sewer via 24-in. x 24-in. open catch basin per OSPSC section 1108.0 standard detail.
- Discharge to storm sewer: NPDES Permit No. 101613

**Figure 3**  
**ICM System Layout**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**



### Legend

- |                                |                          |                               |  |
|--------------------------------|--------------------------|-------------------------------|--|
| ◆ Shallow Zone Monitoring Well | ▲ SVE Well               | □ Pipe Junction Vault         | — Railroad Track                       |
| ◆ Deep Zone Monitoring Well    | ■ LNAPL Pilot Test Well  | — LNAPL Pilot Test Piping     | — Approximate Univar Property Boundary |
| ◆ Piezometer                   | ◆ Vapor Monitoring Probe | — Groundwater Conveyance Pipe | — SVE Conveyance Pipe                  |
| ◆ Active Extraction Well       | ◆ SVE Condensate Sump    | — Pipe Cleanout Vault         | — LNAPL Recovery Equipment Pad         |
| ◆ Inactive Extraction Well     |                          |                               |  |



Aerial Image - City of Portland, Summer 2016

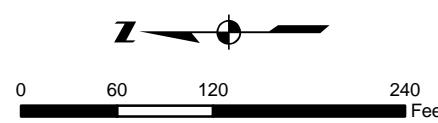
**Figure 4**  
**Groundwater Monitoring Well Network**  
**Univar USA Inc, NW Yeon Ave**  
**Portland, Oregon**



### Legend

- Shallow Zone Monitoring Well
- NAPL Observed This Reporting Period
- Piezometer
- Active Extraction Well
- Inactive Extraction Well
- ↑ Estimated Groundwater Flow Direction
- Groundwater Elevation Contour
- Target Capture Zone
- ▲ SVE Well
- LNAPL Pilot Test Well
- +/- Vapor Monitoring Probe
- SVE Condensate Sump
- Pipe Cleanout Vault
- LNAPL Pilot Test Piping
- Groundwater Conveyance Pipe
- SVE Conveyance Pipe
- Railroad Track
- Approximate Univar Property Boundary

Note:  
 - All elevations given in feet above City of Portland Datum.  
 - NM: Not measured



Aerial Image -City of Portland, Summer 2016

Figure 5

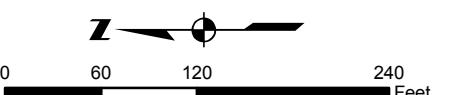
**Shallow Aquifer Groundwater Conditions - 12 December 2017**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**

Environmental Resources Management  
 1001 SW 5th St, Suite 1010  
 Portland, Oregon 97204



### Legend

- ◆ Deep Zone Monitoring Well
- ✖ Abandoned Monitoring Well
- ~~~~ Railroad Track
- ~~~~ Approximate Univar Property Boundary
- ~~~~ Groundwater Elevation Contour
- ← Estimated Groundwater Flow Direction

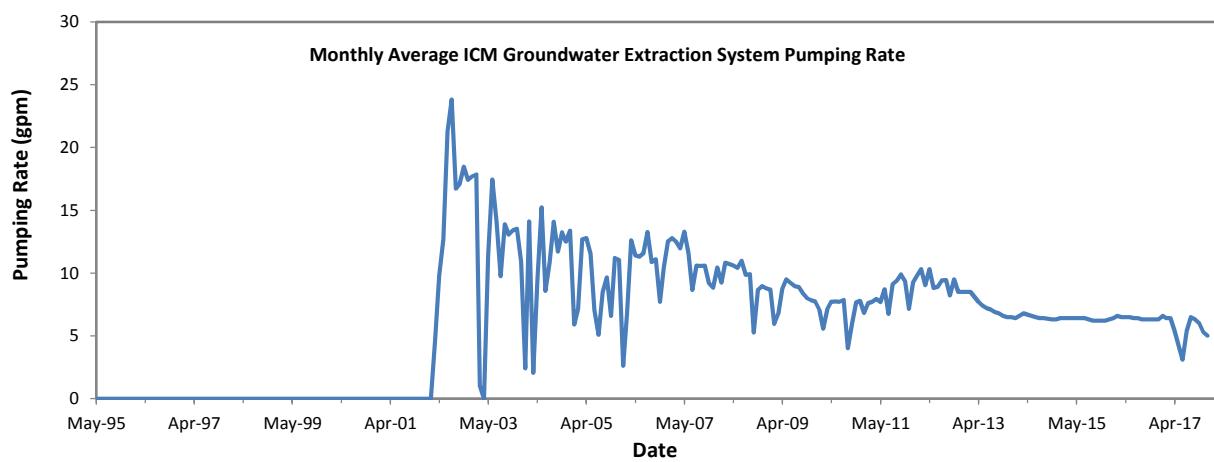
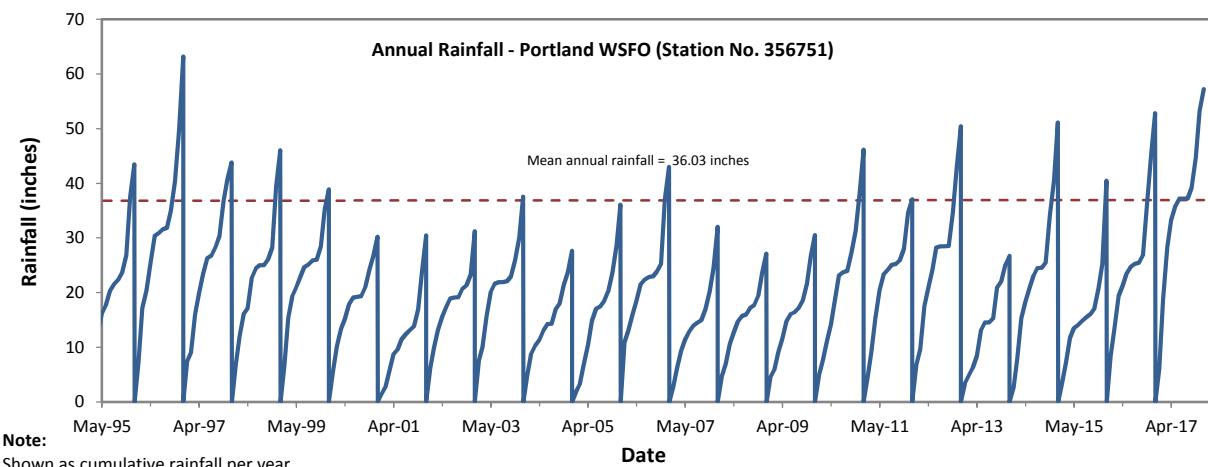
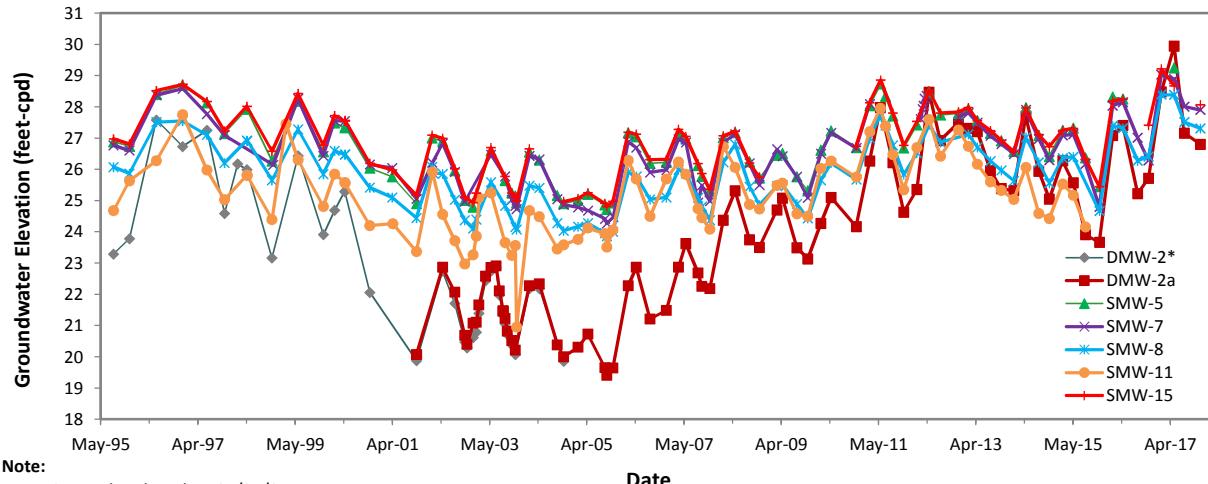


Note:  
 - All elevations given in feet above City of Portland Datum.  
 - †- Not used in contouring due to discrepancy in screened zone with other deep monitoring wells

Aerial Image - City of Portland, Summer 2016

**Figure 6**  
**Deep Aquifer Groundwater Conditions - 12 December 2017**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**

**Figure 7**  
**Selected Monitoring Well Hydrographs (1995 - 2017)**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**



**Notes:**

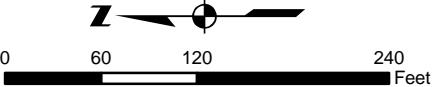
Groundwater ICM - startup on 3/12/2002  
Monthly rainfall obtained from Portland Weather Station  
<http://or.water.usgs.gov/non-usgs/bes/yeon.rain>  
cpd = City of Portland datum  
gpm = gallon per minute



**Legend**

- Shallow Zone Monitoring Well
- NAPL observed during reporting period (4Q17)
- Piezometer
- Active Extraction Well
- Inactive Extraction Well
- Railroad Track
- Approximate Univar Property Boundary

- SVE Well
- Vapor Monitoring Probe
- SVE Condensate Sump
- Pipe Cleanout Vault
- Pipe Junction Vault
- Groundwater Conveyance Pipe
- SVE Conveyance Pipe



**Note:**

- cVOC: Chlorinated volatile organic compounds
- Values shown are the combined concentrations for cVOCs, as designated and summed in Table 4.
- Only detected VOCs are summed.
- All values given in micrograms per liter (ug/L).
- ND = Not detected above laboratory method reporting limit (MRL).
- NS = Not sampled

Aerial Image - City of Portland, Summer 2016

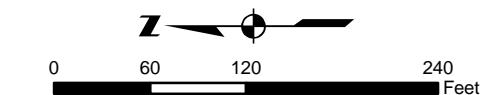
**Figure 8**  
**Total cVOC Concentrations in Shallow Groundwater -December 2017**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**



#### Legend

- ◆ Shallow Zone Monitoring Well
- NAPL observed during reporting period (4Q17)
- ◆ Piezometer
- Active Extraction Well
- Inactive Extraction Well
- Railroad Track
- Approximate Univar Property Boundary

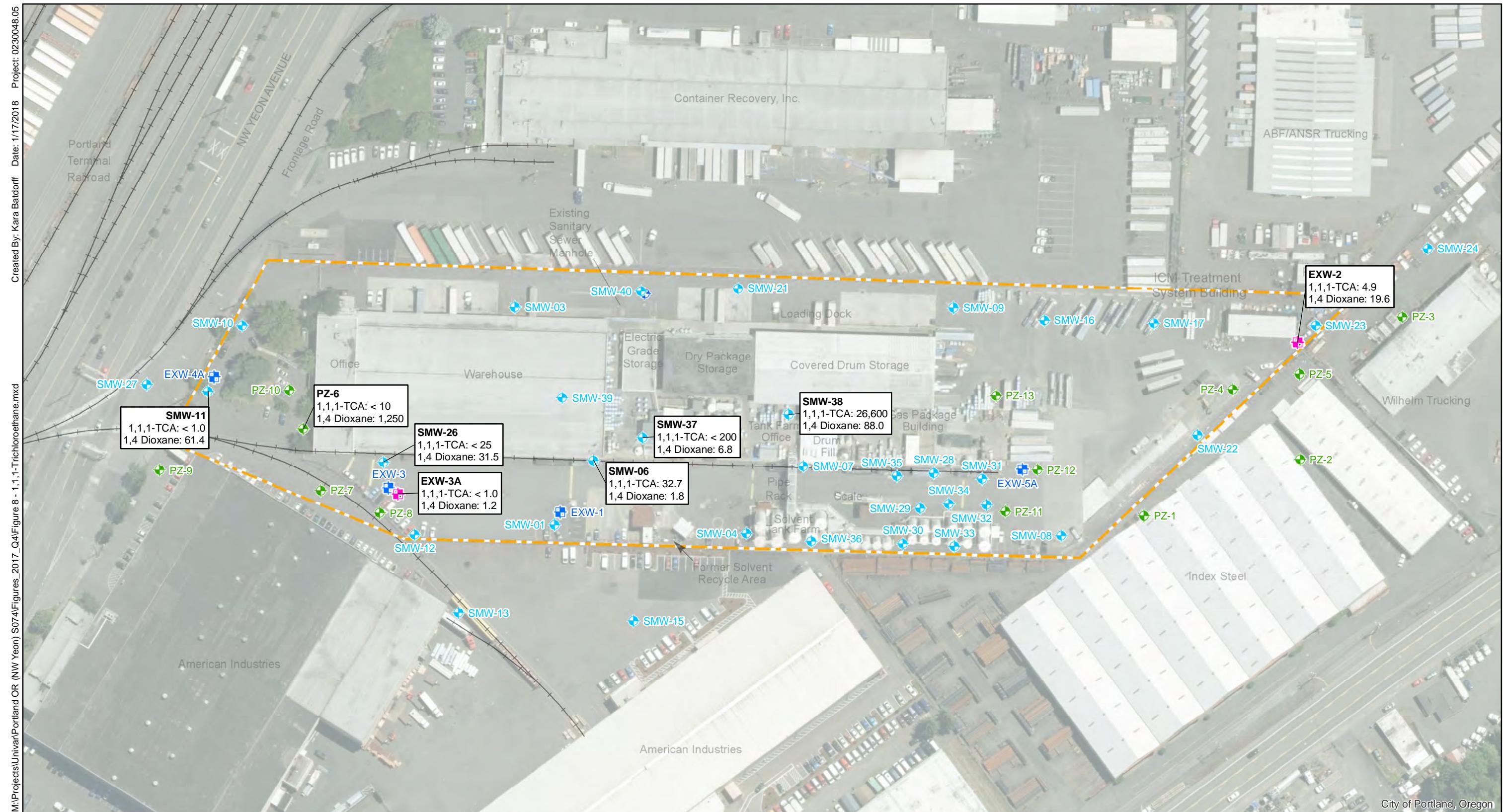
- ▲ SVE Well
- Pipe Junction Vault
- Vapor Monitoring Probe
- Groundwater Conveyance Pipe
- SVE Condensate Sump
- SVE Conveyance Pipe
- Pipe Cleanout Vault



#### Note:

- Non-cVOC: Non-chlorinated volatile organic compounds
- Values shown are the combined concentrations for Non-cVOCs, as designated and summed in Table 4.
- Only detected VOCs are summed.
- All values given in micrograms per liter (ug/L).
- ND = Not detected above laboratory method reporting limit (MRL).
- NS = Not sampled

**Figure 9**  
**Total Non-cVOC Concentrations in Shallow Groundwater -December 2017**  
**Univar USA Inc., NW Yeon Ave**  
**Portland, Oregon**



**Figure 10**

**Figure 10**  
**1,4-Dioxane and 1,1,1-TCA  
concentrations in Shallow  
Groundwater-December 2017  
Univar USA Inc, NW Yeon Ave  
Portland, Oregon**

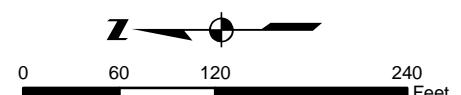
Notes:  
µg/L = micrograms per liter  
1,1,1-TCA = 1,1,1-trichloroethane

## Legend

- Shallow Zone Monitoring Well
  - Piezometer
  - Active Extraction Well
  - Inactive Extraction Well

Approximate Univar Property Boundary

Railroad Track



Aerial Image - City of Portland, Summer 2016

## *Tables*

**Table 1**  
**Approved Groundwater Sampling Schedule**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**

Well Identification	Sampling Frequency	Samples Per Year	Notes
<b>Deep Monitoring Wells</b>			
DMW-1	NA	0	Abandoned in Sept 2011.
DMW-2	NA	0	Abandoned in Jan 2005.
DMW-2a	Annual	1	Sample in May.
DMW-3	Annual	1	Sample in May.
DMW-4	NA	0	Abandoned in Sept 2011.
DMW-5	NA	0	Abandoned in Sept 2011.
DMW-6	Annual	1	Sample in May.
DMW-7	Annual	1	Sample in May.
DMW-8	Annual	1	Installed October 2017. Sample in May.
<b>Shallow Monitoring Wells</b>			
SMW-01	Annual	1	Sample in May.
SMW-02	Annual	1	Sample in May.
SMW-03	Semiannual	2	
SMW-04	Semiannual	2	
SMW-05	Semiannual	2	
SMW-06	Semiannual	2	
SMW-07	Semiannual	2	
SMW-08	Semiannual	2	
SMW-09	Semiannual	2	
SMW-10	Annual	1	Sample in May.
SMW-11	Quarter	4	
SMW-12	Semiannual	2	
SMW-13	Annual	1	Sample in May.
SMW-15	Annual	1	Sample in May.
SMW-16	None	0	
SMW-17	None	0	
SMW-18	NA	0	Abandoned in June 2012.
SMW-19	NA	0	Abandoned in June 2012.
SMW-20	NA	0	Abandoned in June 2012.
SMW-21	Semiannual	2	
SMW-22	Semiannual	2	
SMW-23	Annual	1	Sample in May.
SMW-24	Annual	1	Sample in May.
SMW-25	NA	0	Abandoned in Sept 2007.
SMW-26	Quarter	4	
SMW-27	Annual	1	Sample in May.
SMW-28	None	0	LNAPL monitoring network.
SMW-29	None	0	LNAPL monitoring network.
SMW-30	Semiannual	2	
SMW-31	None	0	LNAPL monitoring network.
SMW-32	None	0	LNAPL monitoring network.
SMW-33	None	0	LNAPL monitoring network.
SMW-34	None	0	LNAPL monitoring network.
SMW-35	None	0	LNAPL monitoring network.
SMW-36	None	0	LNAPL monitoring network.
SMW-37	Semiannual	2	
SMW-38	Semiannual	2	
SMW-39	Semiannual	2	Installed November 2014.
SMW-40	Annual	1	Installed October 2017. Sample in May.
<b>Piezometers</b>			
PZ-1	None	0	
PZ-2	None	0	
PZ-3	None	0	
PZ-4	Semiannual	2	
PZ-5	None	0	
PZ-6	Quarter	4	
PZ-7	Semiannual	2	
PZ-8	Semiannual	2	
PZ-9	Annual	1	Sample in May.
PZ-10	None	0	
PZ-11	Semiannual	2	
PZ-12	Semiannual	2	
PZ-13	None	0	
<b>Extraction Wells</b>			
EXW-1	None	0	
EXW-2	Quarter	4	
EXW-3	None	0	Replaced by EXW-3a.
EXW-3a	Quarter	4	
EXW-4	NA	0	Abandoned in Oct 2001.
EXW-4a	None	0	
EXW-5a	None	0	

73                   Samples per Year

**Notes:**

Water levels will be measured in all wells and piezometers on a minimum quarterly basis.

Light non-aqueous phase liquid (LNAPL) monitoring will be conducted in accordance with the approved work plan.

NA = Not Applicable

**Reference:**

- U.S. Environmental Protection Agency (EPA). 2011. *Approval of Request to Modify Groundwater Monitoring, ICM Monitoring, and Related Reporting (Request), Univar USA Inc., Portland, Oregon. Administrative Order on Consent RCRA Docket No. 1087-10-18-3008(h). EPA ID No. ORD009227398. May 6.*

Table 2

Well Coordinate Data and Groundwater Elevations - December 2017

4th Quarter 2017 Progress Report

UNIVAR USA Inc.

Portland, Oregon

Well Identification	Northings (Y)	Eastings (X)	Measuring Point Elevation feet-cpd	Date	Time	Depth to Product feet-btc	Depth to Groundwater feet-btc	Product Thickness feet	Groundwater Elevation feet-cpd	Corrected Groundwater Elevation feet-cpd
<i>Deep Monitoring Wells</i>										
DMW-2a	693894.009973	7632636.169810	34.86	12/12/2017	12:37	-	8.06	ND	26.80	-
DMW-3	694227.820000	7632838.530000	34.85	12/12/2017	10:55	-	6.71	ND	28.14	-
DMW-6	694117.858934	7632472.316140	36.38	12/12/2017	9:00	-	9.70	ND	26.68	-
DMW-7 <sup>1</sup>	694066.085744	7632846.944330	34.46	12/12/2017	11:09	-	7.78	ND	26.68	-
DMW-8	694065.140000	7632865.030000	34.32	12/12/2017	11:07	-	7.06	ND	27.26	-
<i>Shallow Monitoring Wells</i>										
SMW-01	694177.80042	7632564.63124	36.73	12/12/2017	12:15	ND	8.94	ND	27.79	-
SMW-02	693553.33021	7632708.65031	34.90	12/12/2017	-	-	-	ND	-	-
SMW-03	694227.82492	7632838.33444	34.91	12/12/2017	10:59	ND	7.62	ND	27.29	-
SMW-04	693937.50661	7632557.08631	38.80	12/12/2017	10:36	ND	10.75	ND	28.05	-
SMW-05	694138.09807	7632595.24962	35.43	12/12/2017	-	ND	DRY	ND	-	-
SMW-06	694129.84513	7632648.96375	35.08	12/12/2017	12:33	ND	7.65	ND	27.43	-
SMW-07	693865.99067	7632641.79513	34.75	12/12/2017	12:41	ND	6.85	ND	27.90	-
SMW-08	693541.60582	7632554.65062	37.56	12/12/2017	11:58	ND	10.25	ND	27.31	-
SMW-09	693677.14820	7632841.13264	32.80	12/12/2017	11:20	ND	5.52	ND	27.28	-
SMW-10	694571.56833	7632818.73802	35.54	12/12/2017	7:27	ND	8.76	ND	26.78	-
SMW-11	694614.88112	7632726.25065	35.92	12/12/2017	7:21	ND	9.21	ND	26.71	-
SMW-12	694354.97221	7632555.48756	37.99	12/12/2017	12:22	ND	9.96	ND	28.03	-
SMW-13	694299.63187	7632457.21282	36.72	12/12/2017	9:06	ND	8.61	ND	28.11	-
SMW-15	694079.47089	7632446.69904	36.35	12/12/2017	9:09	ND	8.28	ND	28.07	-
SMW-16	693562.96372	7632825.44371	33.05	12/12/2017	11:27	ND	5.79	ND	27.26	-
SMW-17	694325.06242	7632821.70717	33.51	12/12/2017	11:31	ND	6.41	ND	27.10	-
SMW-21	693947.20639	7632861.54666	33.22	12/12/2017	11:12	ND	6.32	ND	26.90	-
SMW-22	693370.57073	7632680.77307	38.51	12/12/2017	11:40	ND	11.86	ND	26.65	-
SMW-23	693221.65961	7632818.96243	36.82	12/12/2017	11:34	ND	10.50	ND	26.32	-
SMW-24	693080.63463	7632915.83395	36.13	12/12/2017	8:14	ND	9.97	ND	26.16	-
SMW-26	694394.12019	7632646.91881	34.55	12/12/2017	12:28	ND	6.18	ND	28.37	-
SMW-27	694691.80497	7632744.96422	36.44	12/12/2017	8:45	ND	9.72	ND	26.72	-
SMW-28	693701.18457	7632628.91034	34.64	12/12/2017	13:03	ND	5.21	ND	29.43	-
SMW-29	693719.29313	7632589.02982	35.51	12/12/2017	11:44	ND	7.78	ND	27.73	-
SMW-30	693740.83147	7632544.11718	36.45	12/12/2017	10:42	ND	8.41	ND	28.04	-
SMW-31	693641.02299	7632625.84602	34.44	12/12/2017	12:58	ND	6.59	ND	27.85	-
SMW-32	693635.61712	7632593.36903	35.51	12/12/2017	12:55	ND	7.94	ND	27.57	-
SMW-33	693676.17051	7632540.77434	36.59	12/12/2017	11:55	ND	8.90	ND	27.69	-
SMW-34	693683.22955	7632594.45763	35.41	12/12/2017	12:49	ND	7.67	ND	27.74	-
SMW-35	693748.26945	7632629.23184	34.61	12/12/2017	13:12	ND	5.28	ND	29.33	-
SMW-36	693855.88603	7632547.12078	35.87	12/12/2017	10:39	ND	7.51	ND	28.36	-
SMW-37	694067.96927	7632677.80884	38.11	12/12/2017	10:28	32.97	10.12	0.58	27.99	DNAPL observed, no elevation correction applied.
SMW-38	693884.38073	7632706.95904	38.12	12/12/2017	10:24	15 - 20	10.09	NM	28.03	NAPL observed suspended between 15 and 20 ft bfc
SMW-39	694150.35001	7632707.12571	38.15	12/12/2017	10:32	ND	10.06	ND	28.09	-
SMW-40	694070.13000	7632861.95000	34.15	12/12/2017	11:05	ND	6.12	ND	28.03	-
<i>Piezometers</i>										
PZ-1	694337.54699	7632579.45831	35.87	12/12/2017	8:28	ND	8.90	ND	26.97	-
PZ-2	693241.21699	7632650.40437	35.89	12/12/2017	8:22	ND	9.32	ND	26.57	-
PZ-3	693112.72053	7632829.69994	36.68	12/12/2017	8:10	ND	10.41	ND	26.27	-
PZ-4	693325.92285	7632738.37108	37.25	12/12/2017	11:37	ND	10.72	ND	26.53	-
PZ-5	693242.06344	7632757.71419	36.37	12/12/2017	8:25	ND	9.92	ND	26.45	-
PZ-6	694449.76205	7632688.95383	35.06	12/12/2017	7:18	ND	8.28	ND	26.78	-
PZ-7	694472.84543	7632611.47695	34.80	12/12/2017	7:14	ND	7.51	ND	27.29	-
PZ-8	694398.74223	7632582.70765	35.56	12/12/2017	7:10	ND	7.50	ND	28.06	-
PZ-9	694675.51399	7632636.78461	36.14	12/12/2017	7:29	ND	9.44	ND	26.70	-
PZ-10	694512.40441	7632737.81889	34.43	12/12/2017	7:15	ND	7.65	ND	26.78	-
PZ-11	693612.14538	7632584.76211	35.93	12/12/2017	11:50	ND	8.39	ND	27.54	-
PZ-12	693571.67007	7632637.20065	35.50	12/12/2017	11:45	ND	8.11	ND	27.39	-
PZ-13	693623.81071	7632730.62599	34.29	12/12/2017	11:04	ND	5.20	ND	29.09	-
<i>Extraction Wells - Operating</i>										
EXW-1	694152.48354	7632580.72865	34.98	12/12/2017	12:11	ND	6.86	ND	28.12	-
EXW-2	693244.55688	7632797.67080	36.49	12/12/2017	11:36	ND	10.11	ND	26.38	-
EXW-3a	694375.74982	7632606.99894	34.38	12/12/2017	12:25	ND	6.38	ND	28.00	-
<i>Extraction Wells - Idle</i>										
EXW-3	694387.74127	7632614.34834	34.69	12/12/2017	12:27	ND	6.56	ND	28.13	-
EXW-4a	694606.63683	7632753.92581	33.49	12/12/2017	7:24	ND	6.31	ND	27.18	-
EXW-5a	693590.57915	7632637.59435	33.44	12/12/2017	11:47	ND	5.98	ND	27.46	-

## Notes:

Northing/Easting in NAD\_1983\_StatePlane\_Oregon\_North\_FIPS\_3601\_Feet

Measuring point = top of well casing or top of well cap.

Elevations are in feet relative to the City of Portland datum (cpd).

Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL from SMW-28 and SG-6 on 10/17/2008 and 9/13/2007, respectively.

Specific Gravity (SG) of dense nonaqueous phase liquid (DNAPL) assumed to be 1.3 based on analysis of DNAPL from SMW-38 on 10/17/2008.

bfc = below top of casing.

ND = not detected.

NM = not measured.

- = not applicable.

<sup>1</sup> = Deep monitoring well, DMW-7, is screened in the gravel aquifer; screened interval is inconsistent with other deep monitoring wells.

Table 3

Groundwater Sampling Field Parameters - December 2017

4th Quarter 2017 Progress Report

Univar USA Inc.

Portland, Oregon

Well Identification	Date	Depth to Groundwater feet-btc	Purge Time minutes	Purge Rate mL/min	Purge Volume liters	pH	Specific Conductance mS/cm	Temperature °C	ORP mV	Dissolved Oxygen mg/L
<b>Deep Monitoring Wells</b>										
DMW-8	12/13/2017	7.71	12	160	2.40	6.77	0.908	13.95	-110.50	0.98
<b>Shallow Monitoring Wells</b>										
SMW-03	12/13/2017	7.61	15	160	2.40	6.50	0.698	14.69	41.20	1.20
SMW-04	12/13/2017	10.73	15	160	2.40	6.55	0.065	15.11	52.30	1.14
SMW-05 <sup>2</sup>	12/14/2017	-	-	-	-	-	-	-	-	-
SMW-06	12/13/2017	6.98	15	160	2.40	6.58	0.370	13.85	62.90	0.66
SMW-07	12/13/2017	6.78	15	160	2.40	6.30	1.146	15.20	-46.80	0.65
SMW-08	12/15/2017	5.60	18	160	2.88	5.60	0.131	14.35	64.90	0.66
SMW-09	12/13/2017	5.45	15	160	2.40	6.84	0.254	15.17	-72.70	1.06
SMW-11	12/13/2017	9.21	5	160	2.400	6.86	0.419	14.38	-109	0.49
SMW-12	12/13/2017	9.92	15	160	2.40	6.77	0.247	14.29	-64.10	0.85
SMW-21	12/13/2017	6.31	15	160	2.40	6.59	1.102	14.73	-81.40	0.80
SMW-22	12/14/2017	11.85	15	160	2.40	6.73	0.447	12.93	-72.40	0.91
SMW-26	12/13/2017	6.52	18	160	2.880	6.75	0.647	15.49	-102	0.42
SMW-30	12/14/2017	8.40	15	160	2.40	6.55	0.488	14.63	-65.20	0.88
SMW-37	12/14/2017	10.05	12	160	2.40	6.62	0.846	11.77	7.90	0.72
SMW-38	12/14/2017	10.06	15	160	2.40	6.37	1.021	11.30	-17.40	0.82
SMW-39	12/14/2017	10.03	15	160	2.40	6.85	0.636	14.79	-9.50	0.57
SMW-40	12/13/2017	6.11	15	160	2.40	6.96	1.171	15.03	-85.10	0.69
<b>Piezometers</b>										
PZ-4	12/14/2017	10.74	15	160	2.40	6.60	0.619	13.73	-81.40	0.70
PZ-6	12/13/2017	8.30	15	160	2.400	6.60	1.528	12.70	-108	0.90
PZ-7	12/14/2017	6.95	15	160	2.40	6.84	0.263	14.20	-106.70	0.51
PZ-8	12/14/2017	7.52	15	160	2.40	6.91	0.218	13.39	-43.10	0.71
PZ-11	12/15/2017	8.32	15	160	2.40	6.59	1.289	14.16	-89.40	1.09
PZ-12	12/15/2017	8.08	15	160	2.40	6.41	1.171	14.79	-72.40	5.64
<b>Extraction Wells<sup>1</sup></b>										
EXW-2	12/15/2017	10.10	18.0	160.0	2.88	6.82	0.582	13.39	-93	0.68
EXW-3a	12/14/2017	6.29	15.0	160.0	2.40	7.17	0.098	15.13	1	3.59

**Notes:**<sup>1</sup> = Extraction wells EXW-2 and EXW-3a were operating at the time of sampling.<sup>2</sup> = Well is dry.

ORP = oxidation reduction potential, measured in millivolts (mV).

pH, measured in standard units.

µS/cm = microsiemens per centimeter @ 25°C.

°C = degrees Celsius.

mL/min = milliliter per minute

mg/L = milligrams per liter.

NA = not applicable.

btc = below top of casing

Table 4  
Groundwater Analytical Results (VOCs) - December 2017  
4th Quarter 2017 Progress Report  
Univar USA Inc.

Constituent <sup>1</sup>	VOC Classification	Units	Cleanup Levels		ODEQ RBDM - RBCs	Most Conservative CUL	Shallow Wells														Deep Wells		Gravel Well		Extraction Wells				Piezometers													
			On-Site	Off-Site	Construction and Excavation Worker		SMW-03	SMW-04	SMW-06	SMW-07	SMW-08	SMW-09	SMW-11	SMW-12	SMW-21	SMW-22	SMW-26	SMW-30	SMW-37	SMW-38	SMW-39	SMW-40	SMW-40	DMW-8	DMW-8	DMW-7	EXW-2	EXW-3A	PZ-11	PZ-12	PZ-4	PZ-6	PZ-7	PZ-8								
			Office Worker	Office Worker	GW in Excavation		12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017									
1,1,1,2-Tetrachloroethane	cVOC	ug/L	-	2.0	U	1.0	1.0	U	1.0	U	25	U	200	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U						
1,1,1-Trichloroethane	cVOC	ug/L	495	618	1,100,000	-	495	2.0	U	19.5	U	32.7	U	1.0	U	1.0	U	4.4	25	U	200	U	26,600	J+	1,550	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	
1,1,2,2-Tetrachloroethane	cVOC	ug/L	-	2.0	U	1.0	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
1,1,2-Trichloroethane	cVOC	ug/L	-	2.0	U	1.0	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U				
1,1-Dichloroethane	cVOC	ug/L	335	428	10,000	335	11.0	6.1	5.7	1,530	1.6	J-	121	1.0	U	1.0	U	12.5	129	J+	4.3	200	U	1,290	1.0	U	15.9	1,190	16.9	15.1	17.2	21.3	1.0	U	1.0	U	1.0	U	1.0	U		
1,1-Dichloroethene	cVOC	ug/L	144	50	43,000	50	2.0	U	3.2	1.0	U	1,460	1.0	U	25	U	1.0	U	1.0	U	1.0	U	199	J+	2.0	U	750	324	1.7	84.7	1.6	1.0	U	12.5	1.0	U	1.0	U	1.0	U	1.0	U
1,1-Dichloropropane	cVOC	ug/L	-	2.0	U	1.0	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		
1,2,2,2-Tetrachloroethane	cVOC	ug/L	-	4.0	U	2.0	U	2.0	U	2,000	U	2.0	U	30	U	2.0	U	30	U	40	U	400	U	100	U	200	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U			
1,2,3-Trichloropropane	cVOC	ug/L	-	4.0	U	2.0	U	2.0	U	2,000	U	2.0	U	50	U	2.0	U	50	U	100	U	100	U	200	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U					
1,2,4-Trichlorobenzene	cVOC	ug/L	-	4.0	U	2.0	U	2.0	U	2,000	U	2.0	U	50	U	2.0	U	50	U	100	U	100	U	200	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U					
1,2-Dibromo-3-chloropropane	cVOC	ug/L	-	10	U	5.0	U	5.0	U	1,000	U	1.0	U	1,000	U	250	U	5.0	U	13	5.0	U	2,500	U	1,000	U	5.0	U	5.0	U												
1,2-Dichlorobenzene	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,2-Dichloroethane	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,2-Dichloropropane	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,3-Dibromopropane	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,4-Dibromobutene	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,4-Dibromobutene	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,4-Dibromobutene	cVOC	ug/L	-	2.0	U	1.0	U	1.0	U	1,000	U	25	U	1.0	U	1.0	U	25	U	200	U	50	U	100	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U			
1,4-Dichlorobutene	cVOC	ug/L	-	2.0	U	1.0	U	1.0																																		

**Table 5**  
*Groundwater Analytical Results (1,4-Dioxane Investigation) - December 2017*  
*4th Quarter 2017 Progress Report*  
*Univar USA Inc.*

Constituent <sup>1</sup>	Units	Shallow Wells					Extraction Wells		Piezometer								
		SMW-06	SMW-11	SMW-26	SMW-37	SMW-38	EXW-2	EXW-3A	PZ-6								
		12/13/2017	12/13/2017	12/13/2017	12/14/2017	12/14/2017	12/15/2017	12/14/2017	12/13/2017								
1,4-Dioxane	µg/L	1.8	J-	61.4	J-	31.5	J-	6.8	J	88.0	J	19.6	J-	1.2	J-	1,250	J-

**Notes:**

<sup>1</sup> = 1,4-dioxane analysis by EPA Method 8260 SIM.

J- = Result is estimated low.

UJ- = Result is non-detect with low bias.

Detected results shown in **bold**.

µg/L = micrograms per liter

*Appendix A*  
*Time vs. Concentration Trend*  
*Plots – VOCs in Groundwater*

**APPENDIX A - TIME VS. CONCENTRATION TREND PLOTS - VOCs IN GROUNDWATER**

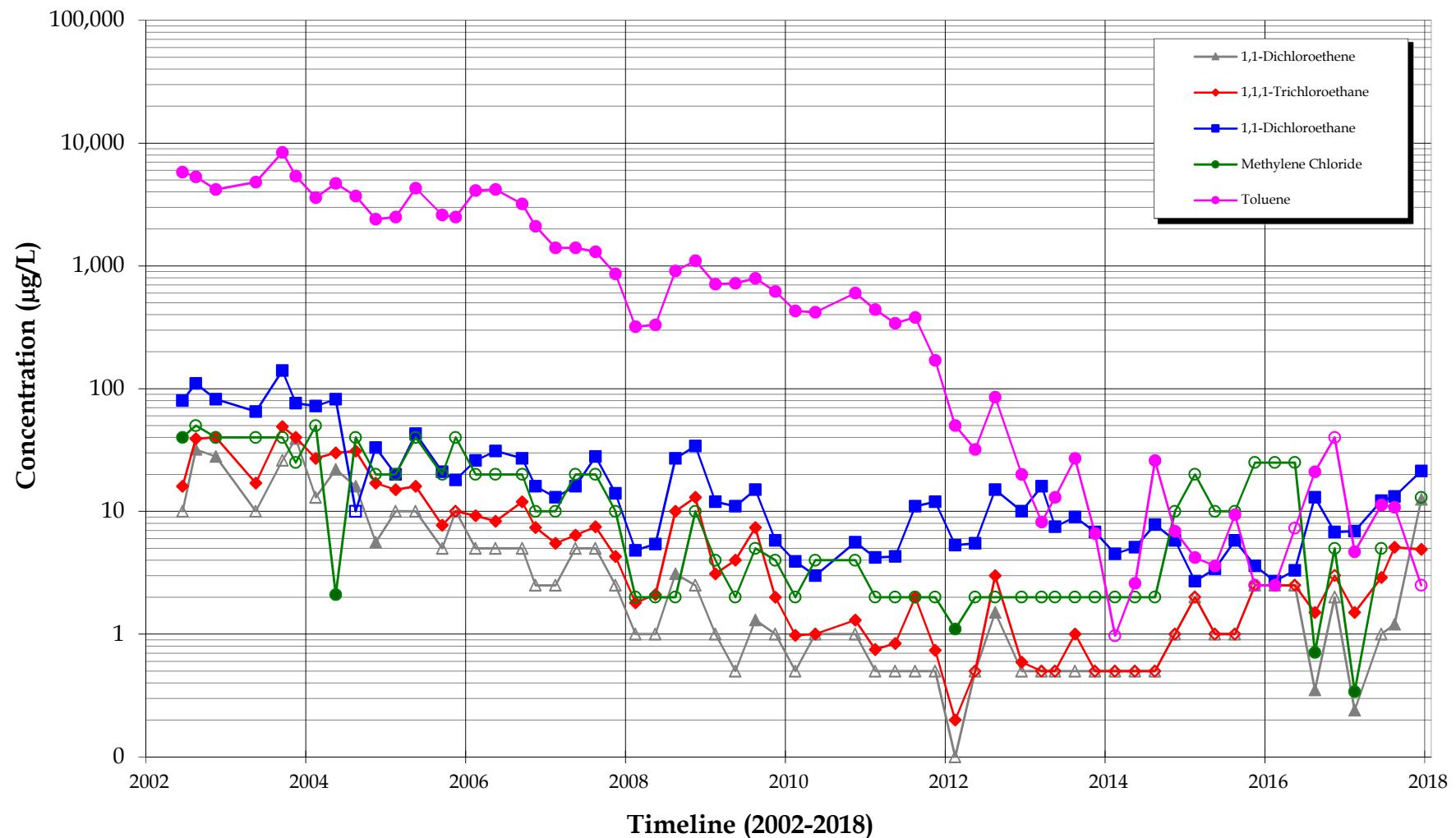
***SHALLOW GROUNDWATER***

*EXW-2*

*EXW-3 / 3a*

# Extraction Well EXW-2

## TCE and Degradation Compounds, Methylene Chloride, and Toluene



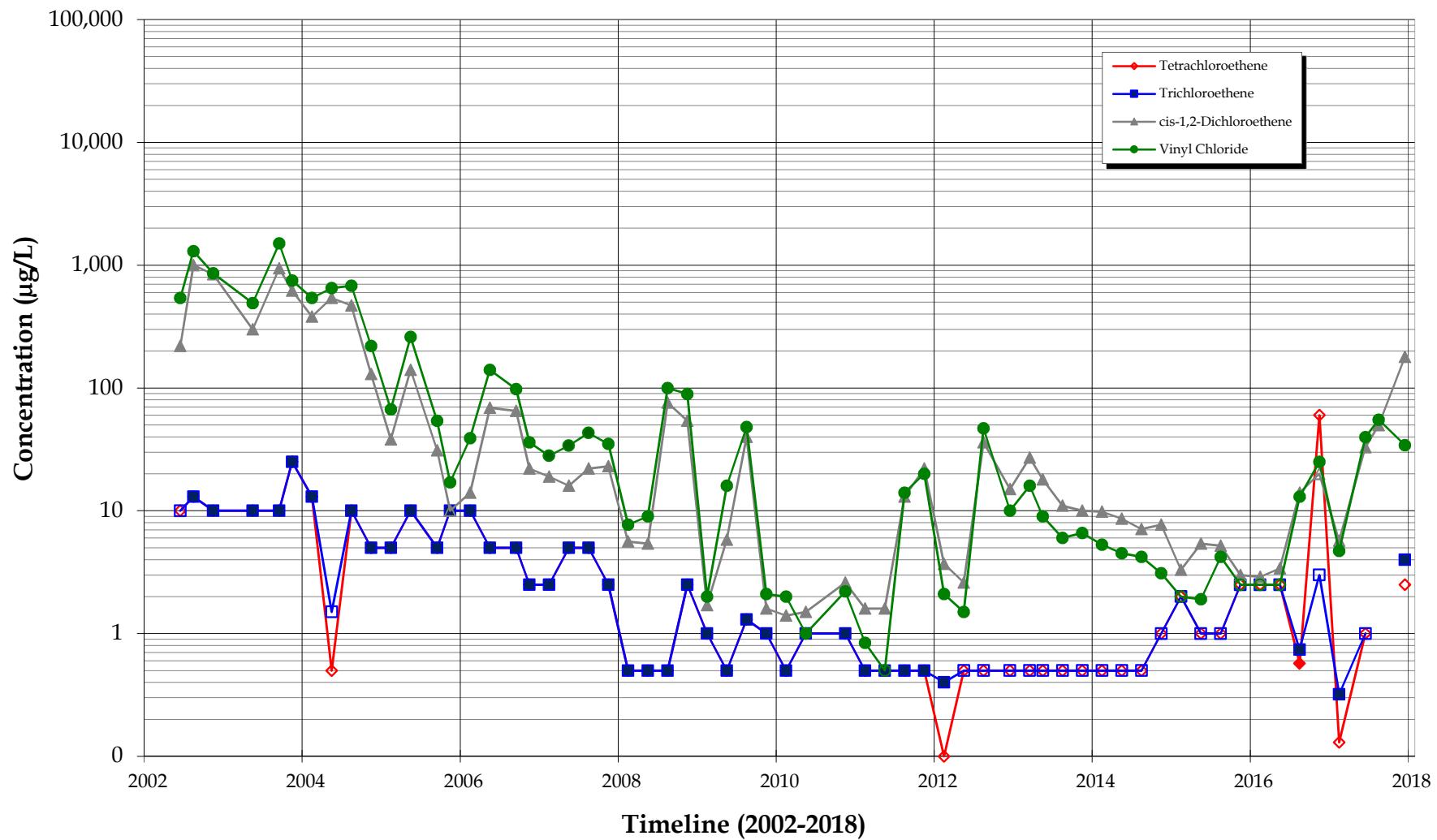
### Notes:

ICM Groundwater Extraction began on 3/12/02.

Operating groundwater extraction well.

# Extraction Well EXW-2

## PCE, TCE, and Degradation Compounds



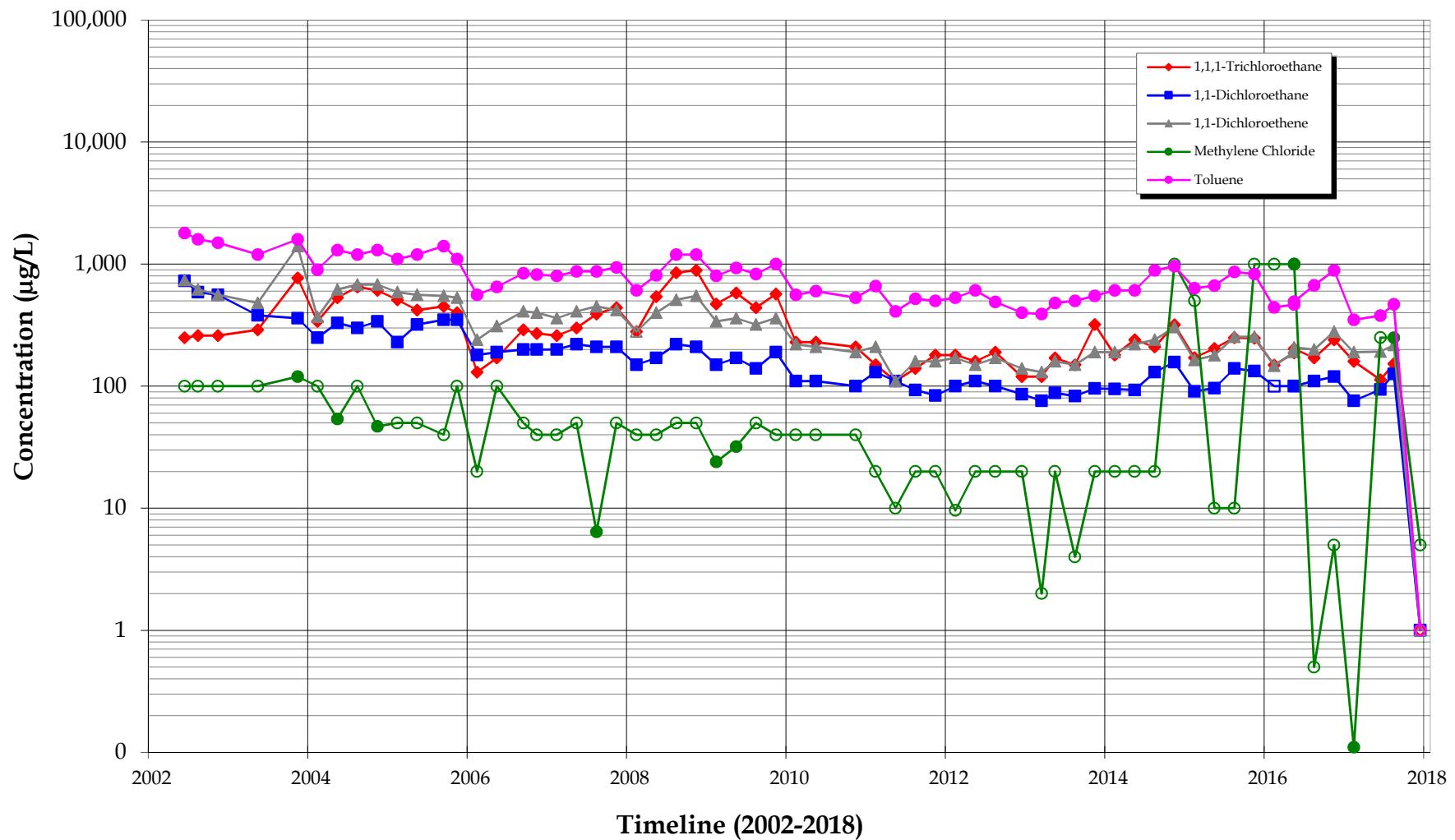
### Notes:

ICM Groundwater Extraction began on 3/12/02.

Operating groundwater extraction well.

# Extraction Well EXW-3/-3a

## TCE and Degradation Compounds, Methylene Chloride, and Toluene



### Notes:

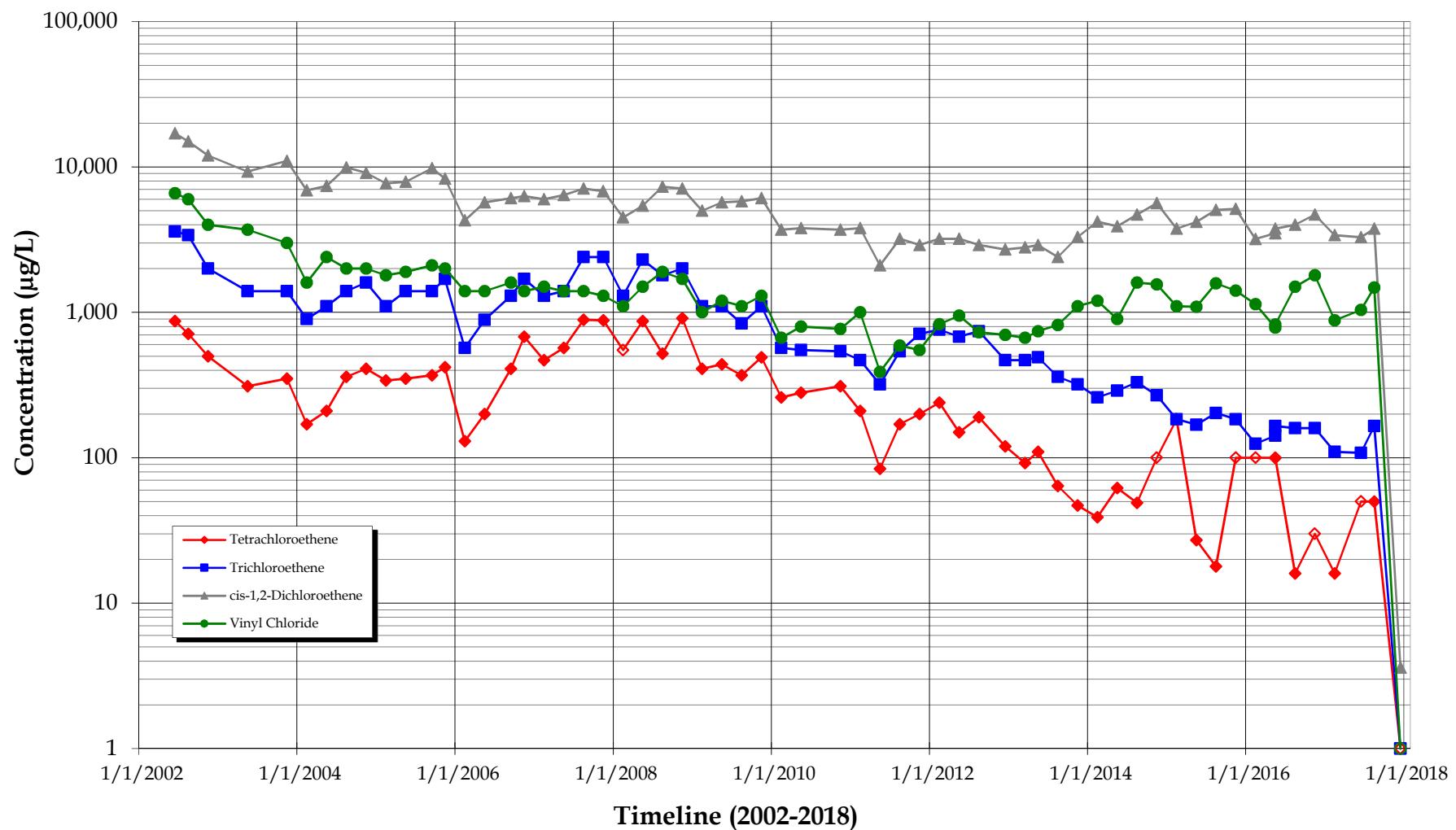
ICM Groundwater Extraction began on 3/12/02.

EXW-3 was replaced with nearby EXW-3a in March 2011.

Operating groundwater extraction well.

# Extraction Well EXW-3/-3a

## PCE, TCE, and Degradation Compounds



### Notes:

ICM Groundwater Extraction began on 3/12/02.

EXW-3 was replaced with nearby EXW-3a in March 2011.

Operating groundwater extraction well.

*Appendix B*  
*Interim Corrective Measures*  
*Monitoring Summary*

Table B1

*Approved ICM Monitoring and Sampling Schedule  
4th Quarter 2017 Progress Report  
Univar USA Inc.  
Portland, Oregon*

	<b>Current Schedule</b>	<b>Rationale</b>
<b>Water Extraction / Treatment Activities</b>		
Extraction Well Sampling	Quarterly - pumping wells only	See Table 1 of main report.
Extraction Well Monitoring and Inspections	Bi-weekly	Bi-weekly adequate given consistent performance. PLC auto-dialer programmed to notify operator in event of extraction well(s) shut down.
Air Stripper Influent/Effluent Sampling	Monthly <sup>1</sup>	No change - frequency dictated by NPDES permit (DEQ, 2010).
Water Treatment System pH Monitoring	Daily (in line)	In line pH meter and data logger installed to collect NPDES permit-required data.
Water Treatment System O&M Inspections	Weekly	No changes.
<b>Soil Vapor Extraction Activities</b>		
Existing SVE Well Sampling	As needed	Discontinue quarterly sampling and sample only when needed for wellfield balancing.
New SVE Well Sampling	Per Work Plan <sup>2</sup>	New SVE wells will be brought online and sampled consistent with the work plan (PES, 2011), then sampled quarterly until concentration/trends stabilize.
SVE Well Monitoring (w/PID) and Inspections	Monthly	Monthly Photoionization detector (PID) data sufficient to track general VOC trends.
Combined SVE Influent (VSP-2) Sample	Monthly	No change - used to estimate mass removal.
Combined SVE Influent (VSP-2) Monitoring (w/PID)	Weekly	No changes.
<b>Vapor Treatment Activities</b>		
Vapor System Influent/Effluent Sampling	Once per change out or quarterly (min)	For change out cycles of less than three months, sampling will be conducted prior to change out based on PID monitoring. For at least 3 months, at least one sample will be collected per quarter.
Vapor System Monitoring (w/PID) and Inspections	Weekly <sup>2</sup>	Vapor system performance very stable and weekly monitoring adequate to track general VOC trends. Additional monitoring may be implemented per the work plan (PES, 2011).

**Notes:**

PID = photoionization detector

SVE = soil vapor extraction

VOC = volatile organic compound

**References:**<sup>1</sup> = Oregon Department of Environmental Quality (DEQ). 2010. National Pollutant Discharge Elimination System Waste Discharge Permit No, 101613, Expiration Date September 30, 2014, File number 100517. September 20.<sup>2</sup> = PES Environmental, Inc. (PES). 2011. Interim Corrective Measures Expansion and LNAPL Pilot Test Work Plan, Univar USA Inc., Portland, Oregon. Prepared for Univar USA Inc. January 3

Table B2a

ICM Treatment System  
 Daily Field Monitoring Data  
 4th Quarter 2017 Progress Report  
 Univar USA Inc.  
 Portland, Oregon

Date	Daily Average Extraction Well Pumping Rate			VOC Concentrations at Vapor Monitoring Points							Vapor Flow Rate		
	EXW-2 gpm	EXW-3a gpm	Total gpm	VSP-1 Air Stripper Discharge ppmv	VSP-2 SVE System ppmv	Vapor Treatment System				VSP-1 Air Stripper Discharge cfm	VSP-2 SVE System <sup>1</sup> cfm	VSP-5 Effluent cfm	
						VSP-3b Influent ppmv	VSP-4a Midpoint ppmv	VSP-4b Midpoint ppmv	VSP-5 Effluent ppmv				
10/1/2017	0	0	0.0										
10/2/2017	0	0	0.0										
10/3/2017	0	0	0.0										
10/4/2017	0	0	0.0										
10/5/2017	0	0	0.0										
10/6/2017	0	0	0.0										
10/7/2017	0	0	0.0										
10/8/2017	0	0	0.0										
10/9/2017	0	0	0.0										
10/10/2017	0	0	0.0										
10/11/2017	0	0	0.0										
10/12/2017	0	0	0.0										
10/13/2017	0	0	0.0										
10/14/2017	0	0	0.0										
10/15/2017	0	0	0.0										
10/16/2017	0	0	0.0										
10/17/2017	0	0	0.0										
10/18/2017	0	0	0.0										
10/19/2017	0	0	0.0										
10/20/2017	0	0	0.0										
10/21/2017	0	0	0.0										
10/22/2017	0	0	0.0										
10/23/2017	6.0	0.0	6.0										
10/24/2017	6.0	0.0	6.0										
10/25/2017	6.0	0.0	6.0	0.5		11.8	0.2	0	0	252	130.3	379	
10/26/2017	6.0	0.0	6.0										
10/27/2017	6.0	0.0	6.0										
10/28/2017	6.0	0.0	6.0										
10/29/2017	6.0	0.0	6.0										
10/30/2017	6.0	0.0	6.0										
10/31/2017	6.0	0.0	6.0										

## Notes:

Daily groundwater extraction well pumping rate calculated from monthly run time and totalizer volume.

Vapor monitoring points are field monitored for volatile organic compound (VOC) concentrations using a photoionization detector (PID).

VSP-1 is the monitoring point located at the air stripper vapor discharge to the vapor treatment system.

VSP-2 is the vapor monitoring point located at the SVE system discharge to the vapor treatment system.

VSP-3b is the vapor monitoring point located at the inlet to the vapor treatment system (combining vapors from the air stripper and the SVE system).

VSP-4a is the vapor monitoring point located at the midpoint between the first and second set of carbon vessels.

VSP-4b is the vapor monitoring point located at the midpoint between the second and third set of carbon vessels.

VSP-5 is the vapor monitoring point located at the outlet of the vapor treatment system.

cfm = cubic feet per minute

gpm = gallons per minute.

ppmv = parts per million by volume.

VOC = volatile organic compound

Blank cell = not measured.

<sup>1</sup> = Flow rate is a calculated value based on velocity and vacuum field readings.

- = System shut down for maintenance, measurements not recorded.

Table B2b

**ICM Treatment System**  
**Daily Field Monitoring Data**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**

Date	Daily Average Extraction Well Pumping Rate			VOC Concentrations at Vapor Monitoring Points							Vapor Flow Rate		
	EXW-2 gpm	EXW-3a gpm	Total gpm	VSP-1 Air Stripper Discharge ppmv	VSP-2 SVE System ppmv	Vapor Treatment System				VSP-1 Air Stripper Discharge cfm	VSP-2 SVE System <sup>1</sup> cfm	VSP-5 Effluent cfm	
						VSP-3b Influent ppmv	VSP-4a Midpoint ppmv	VSP-4b Midpoint ppmv	VSP-5 Effluent ppmv				
11/1/2017	5.3	0.0	5.3	0.5	11.1	8.3	0.7	0	0.0	246	141.0	387	
11/2/2017	5.3	0.0	5.3										
11/3/2017	5.3	0.0	5.3										
11/4/2017	5.3	0.0	5.3										
11/5/2017	5.3	0.0	5.3										
11/6/2017	5.3	0.0	5.3										
11/7/2017	5.3	0.0	5.3										
11/8/2017	5.3	0.0	5.3										
11/9/2017	5.3	0.0	5.3	0.4	8.7	5.7	0	0	0	249	107.0	356	
11/10/2017	5.3	0.0	5.3										
11/11/2017	5.3	0.0	5.3										
11/12/2017	5.3	0.0	5.3										
11/13/2017	5.3	0.0	5.3										
11/14/2017	5.3	0.0	5.3	0.3	12.1	8.5	0	0	0	250	118.0	368	
11/15/2017	5.3	0.0	5.3										
11/16/2017	5.3	0.0	5.3										
11/17/2017	5.3	0.0	5.3										
11/18/2017	5.3	0.0	5.3										
11/19/2017	5.3	0.0	5.3										
11/20/2017	5.3	0.0	5.3										
11/21/2017	5.3	0.0	5.3	0.5	9.3	6.9	0	0	0	253	113.0	366	
11/22/2017	5.3	0.0	5.3										
11/23/2017	5.3	0.0	5.3										
11/24/2017	5.3	0.0	5.3										
11/25/2017	5.3	0.0	5.3										
11/26/2017	5.3	0.0	5.3										
11/27/2017	5.3	0.0	5.3										
11/28/2017	5.3	0.0	5.3										
11/29/2017	5.3	0.0	5.3	0.3	7.5	2.5	0.1	0	0	249	110.0	359	
11/30/2017	5.3	0.0	5.3										

**Notes:**

Daily groundwater extraction well pumping rate calculated from monthly run time and totalizer volume.

Vapor monitoring points are field monitored for volatile organic compound (VOC) concentrations using a photoionization detector (PID).

VSP-1 is the monitoring point located at the air stripper vapor discharge to the vapor treatment system.

VSP-2 is the vapor monitoring point located at the SVE system discharge to the vapor treatment system.

VSP-3b is the vapor monitoring point located at the inlet to the vapor treatment system (combining vapors from the air stripper and the SVE system).

VSP-4a is the vapor monitoring point located at the midpoint between the first and second set of carbon vessels.

VSP-4b is the vapor monitoring point located at the midpoint between the second and third set of carbon vessels.

VSP-5 is the vapor monitoring point located at the outlet of the vapor treatment system.

cfm = cubic feet per minute

gpm = gallons per minute.

ppmv = parts per million by volume.

VOC = volatile organic compound

Blank cell = not measured.

<sup>1</sup> = Flow rate is a calculated value based on velocity and vacuum field readings.

Table B2c

**ICM Treatment System**  
**Daily Field Monitoring Data**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**

Date	Daily Average Extraction Well Pumping Rate			VOC Concentrations at Vapor Monitoring Points						Vapor Flow Rate		
	EXW-2 gpm	EXW-3a gpm	Total gpm	VSP-1 Air Stripper Discharge ppmv	VSP-2 SVE System ppmv	Vapor Treatment System				VSP-1 Air Stripper Discharge cfm	VSP-2 SVE System <sup>1</sup> cfm	VSP-5 Effluent cfm
						VSP-3b Influent ppmv	VSP-4a Midpoint ppmv	VSP-4b Midpoint ppmv	VSP-5 Effluent ppmv			
12/1/2017	5.0	0.0	5.0									
12/2/2017	5.0	0.0	5.0									
12/3/2017	5.0	0.0	5.0									
12/4/2017	5.0	0.0	5.0									
12/5/2017	0.0	0.0	0.0									
12/6/2017	0.0	0.0	0.0									
12/7/2017	0.0	0.0	0.0									
12/8/2017	5.0	0.0	5.0	0	-	1.3	-	-	-	249.1	259.9	509
12/9/2017	0.0	0.0	0.0									
12/10/2017	0.0	0.0	0.0									
12/11/2017	0.0	0.0	0.0									
12/12/2017	0.0	0.0	0.0									
12/13/2017	0.0	0.0	0.0									
12/14/2017	0.0	0.0	0.0									
12/15/2017	0.0	0.0	0.0									
12/16/2017	0.0	0.0	0.0									
12/17/2017	0.0	0.0	0.0									
12/18/2017	0.0	0.0	0.0									
12/19/2017	0.0	0.0	0.0									
12/20/2017	0.0	0.0	0.0									
12/21/2017	0.0	0.0	0.0									
12/22/2017	0.0	0.0	0.0									
12/23/2017	0.0	0.0	0.0									
12/24/2017	0.0	0.0	0.0									
12/25/2017	0.0	0.0	0.0									
12/26/2017	0.0	0.0	0.0									
12/27/2017	0.0	0.0	0.0									
12/28/2017	5.0	0.0	5.0									
12/29/2017	5.0	0.0	5.0	0.2	11.9	7.3	0	0	0.1	246.7	103.3	350
12/30/2017	5.0	0.0	5.0									
12/31/2017	5.0	0.0	5.0									

**Notes:**

Daily groundwater extraction well pumping rate calculated from monthly run time and totalizer volume.

Vapor monitoring points are field monitored for volatile organic compound (VOC) concentrations using a photoionization detector (PID).

VSP-1 is the monitoring point located at the air stripper vapor discharge to the vapor treatment system.

VSP-2 is the vapor monitoring point located at the SVE system discharge to the vapor treatment system.

VSP-3b is the vapor monitoring point located at the inlet to the vapor treatment system (combining vapors from the air stripper and the SVE system).

VSP-4a is the vapor monitoring point located at the midpoint between the first and second set of carbon vessels.

VSP-4b is the vapor monitoring point located at the midpoint between the second and third set of carbon vessels.

VSP-5 is the vapor monitoring point located at the outlet of the vapor treatment system.

cfm = cubic feet per minute

gpm = gallons per minute.

ppmv = parts per million by volume.

VOC = volatile organic compound

Blank cell = not measured.

<sup>1</sup> = Flow rate is a calculated value based on velocity and vacuum field readings.

- = System shut down for maintenance, measurements not recorded.

**Table B3**  
**ICM Groundwater Extraction Well VOC Concentrations**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**

	CAS #	Units	EXW-2		EXW-3A	
			12/15/2017		12/14/2017	
1,1,1,2-Tetrachloroethane	630-20-6	µg/L	2.5	U	1.0	U
1,1,1-Trichloroethane	71-55-6	µg/L	<b>4.9</b>		1.0	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	2.5	U	1.0	U
1,1,2-Trichloroethane	79-00-5	µg/L	2.5	U	1.0	U
1,1-Dichloroethane	75-34-3	µg/L	<b>21.3</b>		1.0	U
1,1-Dichloroethene	75-35-4	µg/L	<b>12.5</b>		1.0	U
1,1-Dichloropropene	563-58-6	µg/L	2.5	U	1.0	U
1,2,3-Trichlorobenzene	87-61-6	µg/L	5.0	U	2.0	U
1,2,3-Trichloropropane	96-18-4	µg/L	5.0	U	2.0	U
1,2,4-Trichlorobenzene	120-82-1	µg/L	5.0	U	2.0	U
1,2,4-Trimethylbenzene	95-63-6	µg/L	2.5	U	1.0	U
1,2-Dibromo-3-chloropropane	96-12-8	µg/L	13	U	5.0	U
1,2-Dichlorobenzene	95-50-1	µg/L	<b>2.9</b>		1.0	U
1,2-Dichloroethane	107-06-2	µg/L	2.5	U	1.0	U
1,2-Dichloropropane	78-87-5	µg/L	2.5	U	1.0	U
1,3,5-Trimethylbenzene	108-67-8	µg/L	2.5	U	1.0	U
1,3-Dichlorobenzene	541-73-1	µg/L	2.5	U	1.0	U
1,3-Dichloropropane	142-28-9	µg/L	2.5	U	1.0	U
1,4-Dichlorobenzene	106-46-7	µg/L	2.5	U	1.0	U
2,2-Dichloropropane	594-20-7	µg/L	2.5	U	1.0	U
2-Butanone*	78-93-3	µg/L	13	U	5.0	U
2-Hexanone*	591-78-6	µg/L	25	U	10	U
4-Chlorotoluene	106-43-4	µg/L	2.5	U	1.0	U
4-Isopropyltoluene	99-87-6	µg/L	2.5	U	1.0	U
4-Methyl-2-pentanone*	108-10-1	µg/L	13	U	5.0	U
Acetone*	67-64-1	µg/L	63	U	<b>25</b>	U
Benzene	71-43-2	µg/L	<b>3.0</b>		1.0	U
Bromobenzene	108-86-1	µg/L	2.5	U	1.0	U
Bromodichloromethane	75-27-4	µg/L	2.5	U	1.0	U
Bromoform	75-25-2	µg/L	2.5	U	1.0	U
Carbon disulfide*	75-15-0	µg/L	5.0	U	2.0	U
Carbon tetrachloride	56-23-5	µg/L	2.5	U	1.0	U
Chlorobenzene	108-90-7	µg/L	2.5	U	1.0	U
Chlorobromomethane	74-97-5	µg/L	2.5	U	1.0	U
Chloroethane	75-00-3	µg/L	<b>14.9</b>		2.0	U
Chloroform	67-66-3	µg/L	2.5	U	1.0	U
cis-1,2-Dichloroethene	156-59-2	µg/L	<b>179</b>		<b>3.6</b>	
cis-1,3-Dichloropropene	10061-01-5	µg/L	2.5	U	1.0	U
Dibromochloromethane	124-48-1	µg/L	2.5	U	1.0	U
Dibromomethane	74-95-3	µg/L	5.0	U	2.0	U
Ethylbenzene	100-41-4	µg/L	2.5	U	1.0	U
Ethylene dibromide	106-93-4	µg/L	5.0	U	2.0	U
Freon 11	75-69-4	µg/L	5.0	U	2.0	U
Freon 12	75-71-8	µg/L	5.0	U	2.0	U
Hexachlorobutadiene	87-68-3	µg/L	5.0	U	2.0	U
Isopropylbenzene (Cumene)	98-82-8	µg/L	2.5	U	1.0	U
m,p-Xylenes	179601-23-1	µg/L	5.0	U	2.0	U
Methyl bromide	74-83-9	µg/L	5.0	U	2.0	U
Methyl chloride	74-87-3	µg/L	5.0	U	2.0	U
Methylene chloride	75-09-2	µg/L	13	U	5.0	U
Naphthalene	91-20-3	µg/L	13	U	5.0	U
n-Butylbenzene	104-51-8	µg/L	2.5	U	1.0	U
n-Propylbenzene	103-65-1	µg/L	2.5	U	1.0	U
o-Chlorotoluene (2-chlorotoluene)	95-49-8	µg/L	2.5	U	1.0	U
o-Xylene	95-47-6	µg/L	<b>3.5</b>		1.0	U
sec-Butylbenzene	135-98-8	µg/L	2.5	U	1.0	U
Styrene	100-42-5	µg/L	2.5	U	1.0	U
tert-Butylbenzene	98-06-6	µg/L	2.5	U	1.0	U
Tetrachloroethene	127-18-4	µg/L	2.5	U	1.0	U
trans-1,2-Dichloroethene	156-60-5	µg/L	2.5	U	1.0	U
trans-1,3-Dichloropropene	10061-02-6	µg/L	2.5	U	1.0	U
Trichloroethene	79-01-6	µg/L	<b>4.0</b>		1.0	U
Vinyl chloride	75-01-4	µg/L	<b>34.2</b>		1.0	U
TOTAL VOCs <sup>3</sup>			280		4	
Flow Rate <sup>3</sup>			0.0		0.0	
Daily Mass Removal Rate <sup>4</sup>			lb/day	0.000	0.000	

**Notes:**

Detected results shown in **bold**.

U = not detected at or above the the laboratory method reporting limit (MRL) or qualified as not detected per data validation.

µg/L = micrograms per liter

gpm = gallons per minute

lb/day = pounds per day

<sup>1</sup> = VOC analysis by EPA Method 8260b.

<sup>2</sup> = Total VOC concentration is the sum of detected VOC constituents only.

<sup>3</sup> = Flow rate is recorded at the time of sample collection. Extraction wells were not operating on 12/14/2017.

<sup>4</sup> = Daily mass removal rate is based on the groundwater extraction well flow rate and the total VOC concentration.

Table B4

ICM Water Treatment System Analytical Results

Influent (W-1) and Effluent (W-2) Data

4th Quarter 2017 Progress Report

Univar USA Inc.

Portland, Oregon

Constituent	CAS #	Units	Discharge Limits <sup>4</sup>		10/24/2017		11/9/2017		12/29/2017		
			Monthly Average	Daily Maximum	Influent W-1	Effluent W-2	Influent W-1	Effluent W-2	Influent W-1	Effluent W-2	
<b>Volatile Organic Compounds<sup>1</sup></b>											
1,1,1-Trichloroethane	71-55-6	µg/L	13	21	7.2	0.25	U	6.3	0.25	U	
1,1,2,2-Tetrachloroethane	79-34-5	µg/L	--	--	0.30	U	0.30	U	0.30	U	
1,1,2-Trichloroethane	79-00-5	µg/L	5	8	0.47	U	0.47	U	0.47	U	
1,1-Dichloroethane	75-34-3	µg/L	--	--	19.9	0.34	U	16.9	0.34	U	
1,1-Dichloroethene	75-35-4	µg/L	--	--	0.88	j	0.32	U	2.0	0.32	U
1,2-Dichlorobenzene	95-50-1	µg/L	--	--	0.63	j	0.32	U	1.4	0.32	U
1,2-Dichloroethane	107-06-2	µg/L	5	8	0.31	U	0.31	U	0.31	U	
1,2-Dichloropropane	78-87-5	µg/L	--	--	0.43	U	0.43	U	0.43	U	
1,3-Dichlorobenzene	541-73-1	µg/L	--	--	0.22	U	0.22	U	0.22	U	
1,4-Dichlorobenzene	106-46-7	µg/L	--	--	0.26	U	0.26	U	0.26	U	
2-Chloroethyl Vinyl Ether <sup>6</sup>	110-75-8	µg/L	--	--	2.1	U	2.1	U	2.1	U	
Acrolein <sup>6</sup>	107-02-8	µg/L	--	--	6.1	U	6.1	U	6.1	U	
Acrylonitrile <sup>6</sup>	107-13-1	µg/L	--	--	2.1	U	2.1	U	2.1	U	
Benzene	71-43-2	µg/L	5	8	2.4	U	0.31	U	7.7	U	
Bromodichloromethane	75-27-4	µg/L	--	--	0.24	U	0.24	U	0.24	U	
Bromoform	75-25-2	µg/L	--	--	0.41	U	0.41	U	0.41	U	
Carbon Disulfide	75-15-0	µg/L	--	--	0.53	U	0.53	U	0.53	U	
Carbon Tetrachloride	56-23-5	µg/L	--	--	0.36	U	0.36	U	0.36	U	
Chlorobenzene	108-90-7	µg/L	--	--	0.20	U	0.20	U	0.20	U	
Chloroethane	75-00-3	µg/L	5	8	42.5	U	0.67	U	90.1	J+	
Chloroform	67-66-3	µg/L	--	--	0.30	U	0.30	U	0.30	U	
cis-1,2-Dichloroethene	156-59-2	µg/L	25	40	50.3	U	0.28	U	79.2	U	
cis-1,3-Dichloropropene	10061-01-5	µg/L	--	--	0.29	U	0.29	U	0.29	U	
Dibromochloromethane	124-48-1	µg/L	--	--	0.28	U	0.28	U	0.28	U	
Ethylbenzene	100-41-4	µg/L	--	--	73.5	U	0.36	U	30.7	U	
Freon 11	75-69-4	µg/L	--	--	0.50	U	0.50	U	0.50	U	
Freon 113 <sup>6</sup>	76-13-1	µg/L	--	--	0.48	U	0.48	U	0.48	U	
Freon 12	75-71-8	µg/L	--	--	0.50	U	0.50	U	0.50	U	
m,p-Xylenes	179601-23-1	µg/L	--	--	56.6	U	0.47	U	41.9	U	
Methyl bromide	74-83-9	µg/L	--	--	0.59	U	0.59	U	0.59	U	
Methyl chloride	74-87-3	µg/L	--	--	0.50	U	0.50	U	0.50	U	
Methylene Chloride	75-09-2	µg/L	--	--	2.0	U	2.0	U	2.0	U	
o-Xylene	95-47-6	µg/L	--	--	17.7	U	0.26	U	14.4	U	
Styrene	100-42-5	µg/L	--	--	0.22	U	0.22	U	0.22	U	
Tetrachloroethene	127-18-4	µg/L	15	21	0.22	U	0.22	U	0.22	U	
Toluene	108-88-3	µg/L	--	--	11.1	U	0.30	U	7.7	U	
trans-1,2-Dichloroethene	156-60-5	µg/L	25	40	0.81	j	0.22	U	0.60	j	
trans-1,3-Dichloropropene	10061-02-6	µg/L	--	--	0.21	U	0.21	U	0.21	U	
Trichloroethene	79-01-6	µg/L	53	77	0.35	U	0.35	U	0.35	U	
Vinyl Chloride	75-01-4	µg/L	11	18	50.5	U	0.41	U	85.5	U	
Total VOC Concentration			354		2.3		384		2.3		
VOC Percent Removal <sup>5</sup>					99.36%				99.41%		
										98.84%	
<b>Cyanide and Oil &amp; Grease</b>											
Cyanide <sup>2</sup>		µg/L	50	65	--	4.0	j	--	3.0	U	
Oil & Grease <sup>3</sup>		mg/L	10	15	--	1.4	U	--	1.5	U	

**Notes:**Detected results shown in **bold**.

VOC = volatile organic compound

Discharge limits per National Pollution Discharge Elimination System (NPDES) Waste Discharge Permit No. 101613. Permit expiration date of 9/30/2014.

Total VOC concentration for sample W-1 is the sum of detected VOC constituents plus the 1/2 of the sum of laboratory MDLs for constituents that were detected in sample W-2 but not detected in sample W-1.

Total VOC concentration for sample W-2 is the sum of detected VOC constituents plus 1/2 of the sum of laboratory MDLs for constituents that were detected in sample W-1 but not detected in sample W-2.

µg/L = micrograms per liter

mg/L = milligrams per liter

U = not detected at or above the the laboratory method detection limit (MDL) or qualified as not detected per data validation.

J+ = the reported concentration is qualified as estimated and biased high per data validation.

j = The result is an estimated concentration, detected between the Method Detection Limit and the Reporting Limit.

-- = Not applicable

1 = VOC analysis by EPA Method 8260C.

2 = Cyanide analysis by EPA Method 9012A.

3 = Oil and Grease analysis by EPA Method 1664.

4 = Discharge limits apply to W-2 samples only.

5 = VOC percent removal is calculated by the percent difference in total VOCs of the air stripper influent (W-1) and effluent (W-2).

W-2 sample results greater than monthly average discharge limits are shaded.

Table B5

*ICM Soil Vapor Extraction System Field Parameters  
4th Quarter 2017 Progress Report  
Univar USA Inc.  
Portland, Oregon*

	Field PID (ppmv)			Field Velocity (fpm)			Field Vacuum (in.wc)			Field Flow Rate <sup>2</sup> (cfm)		
	10/25/2017	11/9/2017	12/29/2017	10/25/2017	11/9/2017	12/29/2017 <sup>4</sup>	10/25/2017	11/9/2017	12/29/2017	10/25/2017	11/9/2017	12/29/2017
SG-1 <sup>1</sup>	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
SG-2a	9.1	15.7	1.4	348	387	629	48	36	51	5.8	6.6	10.4
SG-3a	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
SG-4a	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
SG-5	56.8	8.1	12.2	5885	4,342	4,565	22	26	26	105.4	75.8	80.9
SG-6	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
SG-7	22.5	22.7	17.3	3671	12,805	6,592	42	14	39	62.3	230.7	112.8
SG-8	11.1	11.4	7	337	295	239	50	54	50	5.6	4.8	4.0
SG-9	42.1	23.3	84.6	387	337	252	48	56	51	6.5	5.4	4.2
RW-1	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
RW-2	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
RW-3	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>	NM <sup>3</sup>
VSP-2	NM <sup>5</sup>	8.7	11.9	2,042	3,025	3,320	52	58	53	128	184	208

**Notes:**

Field monitoring of SVE system is performed on a monthly frequency.

cfm = cubic feet per minute

ft/min = feet per minute

in wc = inches water column

NM = not measured

ppmV = parts per million by volume

SVE = soil vapor extraction

VOC = volatile organic compound

<sup>1</sup> = SG-1 was taken offline in 2011.

<sup>2</sup> = Flow rate calculated using the velocity, vacuum, pipe diameter, and temperature.

<sup>3</sup> = SVE well taken offline during field balancing.

<sup>4</sup> = Velocity measurement at SG-5 and SG-7 affected by moisture in line.

<sup>5</sup> = Velocity too high at VSP-2 to collect PID reading.

Table B6

ICM Soil Vapor Extraction System VOC Concentrations

4th Quarter 2017 Progress Report

Univar USA Inc.

Portland, Oregon

	CAS #	Units	Monthly SVE System Samples				Individual SVE Well Samples						
			Discharge Limits 10/24/2017	VSP-2 11/9/2017		VSP-2 12/29/2017		SG-7 11/9/2017		SG-8 11/9/2017		SG-9 11/9/2017	
				J	UJ	J	UJ	J	UJ	J	UJ	J	UJ
1,1,1-Trichloroethane	71-55-6	µg/m³	19000	7200		6200	J	29000	J	7200	J	42	U
1,1,2,2-Tetrachloroethane	79-34-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,1,2-Trichloroethane	79-00-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,1-Dichloroethane	75-34-3	µg/m³	1100		470		670	J	1700	J	2700	J	42
1,1-Dichloroethene	75-35-4	µg/m³	410		100	U	350	J	310	J	320	J	42
1,2-Dibromoethane	106-93-4	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,2-Dichlorobenzene	95-50-1	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,2-Dichloroethane	107-06-2	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,2-Dichloropropane	78-87-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,3-Dichlorobenzene	541-73-1	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
1,4-Dichlorobenzene	106-46-7	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
2-Butanone	78-93-3	µg/m³	1400	U	1000	U	400	UJ	2400	UJ	400	UJ	420
2-Hexanone	591-78-6	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
4-Methyl-2-pentanone	108-10-1	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Acetone	67-64-1	µg/m³	1400	U	1000	U	400	UJ	2400	UJ	400	UJ	420
Benzene	71-43-2	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Bromodichloromethane	75-27-4	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Bromoform	75-25-2	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Bromomethane	74-83-9	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Carbon Disulfide	75-15-0	µg/m³	1400	U	1000	U	400	UJ	2400	UJ	400	UJ	420
Carbon Tetrachloride	56-23-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Chlorobenzene	108-90-7	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Chloroethane	75-00-3	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Chloroform	67-66-3	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Chloromethane	74-87-3	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
cis-1,2-Dichloroethene	156-59-2	µg/m³	24000		8600		8200	J	25000	J	13000	J	50
cis-1,3-Dichloropropene	10061-01-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Dibromochloromethane	124-48-1	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Ethylbenzene	100-41-4	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	50
m,p-Xylenes	179601-23-1	µg/m³	280	U	200	U	81	UJ	490	UJ	80	UJ	84
Methyl tert-Butyl Ether	1634-04-4	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Methylene Chloride	75-09-2	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
o-Xylene	95-47-6	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Styrene	100-42-5	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Tetrachloroethene	127-18-4	µg/m³	24000		15000		12000	J	37000	J	5300	J	42
Toluene	108-88-3	µg/m³	4700		130		130	J	240	UJ	40	UJ	42
trans-1,2-Dichloroethene	156-60-5	µg/m³	240		100	U	150	J	240	UJ	180	J	42
trans-1,3-Dichloropropene	10061-02-6	µg/m³	140	U	100	U	40	UJ	240	UJ	40	UJ	42
Trichloroethene	79-01-6	µg/m³	9000		6400		5800	J	17000	J	3100	J	42
Trichlorotrifluoroethane	76-13-1	µg/m³	140	U	100	U	140	J	240	UJ	67	J	42
Vinyl Acetate	108-05-4	µg/m³	1400	U	1000	U	400	UJ	2400	UJ	400	UJ	420
Vinyl Chloride	75-01-4	µg/m³	140		100	U	76	J	240	UJ	92	J	99
TOTAL VOCs <sup>2</sup>		µg/m³	82,590		37,800		33,716		110,010		31,959		199
		ppmV	16		7		6		20		6.7		0.06

**Notes:**Detected results shown in **bold**.

Sampling location VSP-2 is the combined SVE system influent to the vapor treatment system, and is sampled on a monthly frequency.

Sampling locations SG-7, SG-8, and SG-9 are individual SVE wells and are sampled as needed to balance the SVE well field.

VOC = volatile organic compound

ppmV = parts per million by volume

SVE = soil vapor extraction

µg/m³ = micrograms per cubic meter

U = not detected at or above the laboratory method reporting limit (MRL) or qualified as not detected per data validation.

UJ = nondetected result qualified as estimated per data validation.

J = The result is an estimated concentration based on evaluation of quality control criteria.

1 = VOC analysis by EPA Method TO-15.

2 = Total VOC concentration is the sum of detected VOC constituents only.

**Table B7**  
**ICM Vapor Treatment System Analytical Results**  
**4th Quarter 2017 Progress Report**  
**Univar USA Inc.**  
**Portland, Oregon**

	CAS #	Units	Discharge Limits <sup>4</sup> VSP-3b 11/9/2017		Mid #1 VSP-4a 11/9/2017		Percent Decrease from VSP-3b	Mid #2 VSP-4b 11/9/2017		Percent Decrease from VSP-3b	Stack VSP-5 11/9/2017		Percent Decrease from VSP-3b
			VSP-3b	J	Mid #1 VSP-4a 11/9/2017	J		Percent Decrease from VSP-3b	Mid #2 VSP-4b 11/9/2017	J	Percent Decrease from VSP-3b	Stack VSP-5 11/9/2017	
1,1,1-Trichloroethane	71-55-6	µg/m <sup>3</sup>	4300	J	15	J	100%	20	J	100%	40		99%
1,1,2,2-Tetrachloroethane	79-34-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,1,2-Trichloroethane	79-00-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,1-Dichloroethane	75-34-3	µg/m <sup>3</sup>	300	J	6.5	J	98%	1.7	J	99%	3.2		99%
1,1-Dichloroethene	75-35-4	µg/m <sup>3</sup>	71	J	790	J	(1013%)	0.62	UJ	100%	0.65	U	100%
1,2-Dichlorobenzene	95-50-1	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,2-Dichloroethane	107-06-2	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,2-Dichloropropane	78-87-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,3-Dichlorobenzene	541-73-1	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
1,4-Dichlorobenzene	106-46-7	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
2-Butanone	78-93-3	µg/m <sup>3</sup>	500	UJ	6.2	UJ	-	6.2	UJ	-	6.5	U	-
2-Hexanone	591-78-6	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
4-Methyl-2-pentanone	108-10-1	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Acetone	67-64-1	µg/m <sup>3</sup>	500	UJ	6.2	UJ	-	6.2	UJ	-	6.5	U	-
Benzene	71-43-2	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Bromodichloromethane	75-27-4	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Bromoform	75-25-2	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Carbon disulfide	75-15-0	µg/m <sup>3</sup>	500	UJ	6.2	UJ	-	6.2	UJ	-	6.5	U	-
Carbon tetrachloride	56-23-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Chlorobenzene	108-90-7	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Chloroethane	75-00-3	µg/m <sup>3</sup>	160	J	150	J	6%	110	J	31%	100		38%
Chloroform	67-66-3	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
cis-1,2-Dichloroethene	156-59-2	µg/m <sup>3</sup>	5100	J	54	J	99%	30	J	99%	55		99%
cis-1,3-Dichloropropene	10061-01-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Dibromochloromethane	124-48-1	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Ethylbenzene	100-41-4	µg/m <sup>3</sup>	100	J	0.77	J	99%	0.86	J	99%	1.1		99%
Ethylene dibromide	106-93-4	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Freon 11	75-69-4	µg/m <sup>3</sup>	50	UJ	2.1	J	-	0.62	UJ	-	0.65	U	-
Freon 113	76-13-1	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
m,p-Xylenes	179601-23-1	µg/m <sup>3</sup>	99	UJ	2.8	J	-	3.1	J	-	3.7		-
Methyl bromide	74-83-9	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Methyl chloride	74-87-3	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Methyl tert-butyl ether	1634-04-4	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Methylene chloride	75-09-2	µg/m <sup>3</sup>	50	UJ	6.4	J	-	3.5	J	-	0.65	U	-
o-Xylene	95-47-6	µg/m <sup>3</sup>	50	UJ	0.90	J	-	1.0	J	-	1.2		-
Styrene	100-42-5	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Tetrachloroethene	127-18-4	µg/m <sup>3</sup>	8400	J	85	J	99%	110	J	99%	230		97%
Toluene	108-88-3	µg/m <sup>3</sup>	130	J	1.1	J	99%	1.6	J	99%	2.0		98%
trans-1,2-Dichloroethene	156-60-5	µg/m <sup>3</sup>	50	UJ	3.0	J	-	0.62	UJ	-	0.65	U	-
trans-1,3-Dichloropropene	10061-02-6	µg/m <sup>3</sup>	50	UJ	0.62	UJ	-	0.62	UJ	-	0.65	U	-
Trichloroethene	79-01-6	µg/m <sup>3</sup>	3700	J	19	J	99%	27	J	99%	47		99%
Vinyl acetate	108-05-4	µg/m <sup>3</sup>	500	UJ	6.2	UJ	-	6.2	UJ	-	6.5	U	-
Vinyl chloride	75-01-4	µg/m <sup>3</sup>	130	J	160	J	(23%)	170	J	(31%)	150		(15%)
TOTAL VOCs <sup>2</sup>		µg/m <sup>3</sup>	22,391		1,297		94%	479		98%	633		97%
Field PID <sup>3</sup>		ppmV	5.7		0.0		100%	0.0		100%	0.0		100%

Date:	Sampling Time:	Time Online (days)			Estimated Vapor Flow Rates <sup>3</sup>
		C-1 Vessels:	C-2 Vessels:	C-3 Vessels:	
11/09/17	8:00	554	364	43	Air Stripper 249 cfm SVE 107 cfm Total 356 cfm

**Notes:**

Detected results shown in **bold**. Negative percent decrease shown in **red**.

Percent removal of VOCs is calculated when both sampling points are detected above the laboratory method reporting limits (MRLs).

Percent removal is assumed to be 100% when the downstream sampling point is less than the MRL.

VSP-3b is the vapor monitoring point located at the inlet to the vapor treatment system (combining vapors from the air stripper and the SVE system).

VSP-4a is the vapor monitoring point located at the midpoint between the first and second set of carbon vessels.

VSP-5 is vapor monitoring point located at the outlet of the vapor treatment system.

µg/L = micrograms per liter

ppmV = parts per million by volume

VOC = volatile organic compound

U = not detected at or above the laboratory method reporting limit (MRL) or qualified as not detected per data validation.

UJ = nondetected result qualified as estimated per data validation.

J = The result is an estimated concentration based on evaluation of quality control criteria.

- = not applicable.

cfm = cubic feet per minute

<sup>2</sup> = Total VOC concentration is the sum of detected VOC constituents only.

Table B8

NAPL Monitoring and Recovery  
 4th Quarter 2017 Progress Report  
 Univar USA Inc.  
 Portland, Oregon

	Measuring Point Elevation feet-cpd	Date	Time	Depth to Product feet-btc	Depth to Groundwater feet-btc	Product Thickness feet	Product Recovered (Yes/No)	Product Thickness After Recovery feet	Groundwater Elevation feet-cpd	Corrected Groundwater Elevation feet-cpd
SMW-07	34.26	12/12/2017	12:41	ND	6.85	-	-	-	27.41	-
SMW-28	34.64	12/12/2017	13:03	ND	5.21	-	-	-	29.43	-
SMW-29	35.51	12/12/2017	12:44	ND	7.78	-	-	-	27.73	-
SMW-31	34.44	12/12/2017	12:58	ND	6.59	-	-	-	27.85	-
SMW-32	35.51	12/12/2017	12:55	ND	7.94	-	-	-	27.57	-
SMW-33	36.59	12/12/2017	11:55	ND	8.90	-	-	-	27.69	-
SMW-34	35.41	12/12/2017	12:49	ND	7.67	-	-	-	27.74	-
SMW-35	34.61	12/12/2017	13:12	ND	5.28	-	-	-	29.33	-
SMW-36	35.87	12/12/2017	10:39	ND	7.51	-	-	-	28.36	-
SMW-37	38.11	12/12/2017	10:28	32.97	10.12	0.58	No	-	27.99	-
SMW-38	38.12	12/12/2017	10:24	15-20	10.09	NM	No	-	28.03	-
EXW-5a	33.44	12/12/2017	11:47	ND	5.98	-	-	-	27.46	-
PZ-11	35.93	12/12/2017	11:50	ND	8.39	-	-	-	27.54	-
PZ-12	35.5	12/12/2017	11:45	ND	8.11	-	-	-	27.39	-
SG-6	35.2	12/12/2017	12:51	7.58	7.59	0.01	No	-	27.61	27.618
RW-1	34.09	12/12/2017	13:10	ND	4.96	-	-	-	29.13	-
RW-2	34.19	12/12/2017	13:05	ND	4.96	-	-	-	29.23	-
RW-3	34.95	12/12/2017	12:47	5.83	5.8	0.03	No	-	29.15	29.17

**Notes:**

Measuring point = top of well casing or top of well cap.

Elevations are in feet relative to the City of Portland datum (cpd).

Specific Gravity (SG) of light nonaqueous phase liquid (LNAPL) assumed to be 0.8 based on analysis of LNAPL from SMW-28 and SG-6 on 10/17/2008 and 9/13/2007, respectively.

Specific Gravity (SG) of dense nonaqueous phase liquid (DNAPL) assumed to be 1.3 based on analysis of DNAPL from SMW-38 on 10/17/2008.

Corrected groundwater water elevation (GWE) calculated as:  $GWE_{corr} = GWE + (NAPL_{thickness} \times SG)$ 

SG-6 is an operating SVE well; groundwater levels are influenced by vacuum on the well during monitoring.

Monitoring wells SMW-28, SMW-29, SMW-34, and SMW-35 are included in the LNAPL Pilot Test.

btc = below top of casing.

in w.c. = inches of water column.

cfm = cubic feet per minute.

ppmV = parts per million by volume.

ND = not detected.

NM = not measured, product suspended in the water column.

- = not applicable.

Table B9

*Summary of ICM Mass Removal  
4th Quarter 2017 Progress Report  
Univar USA Inc.  
Portland, Oregon*

Lab Sample Date	Total VOC Concentration <sup>2</sup> µg/L	Water Volume gallons	Discharge Limits <sup>4</sup> Removed pounds
10/25/2017	354	23,215	0.1
11/10/2017	384	128,646	0.4
12/29/2017	195	183,816	0.4
Current Period (9/30/2017 - 12/29/17)		335,676	0.9
Previously Reported (6/18/2002 - 9/29/2017)		69,172,501	3,085
<b>Total</b>		<b>69,508,178</b>	<b>3,086</b>
<b>Soil Vapor Extraction System<sup>3</sup></b>			
Lab Sample Date	Total VOC Concentration <sup>4</sup> µg/m <sup>3</sup>	Vapor Volume m <sup>3</sup>	Mass Removed pounds
10/24/2017	82,590	43,804	7
11/9/2017	37,800	120,002	16
12/29/2017	33,716	213,973	17
Current Period (9/8/2017 - 12/29/2017)		377,779	39.8
Previously Reported (through 3/11/2002)		-	10,300
Previously Reported (3/12/2002 - 9/7/2017)		14,194,466	25,234
<b>Total</b>		<b>14,572,245</b>	<b>25,273</b>
<b>LNAPL Recovery<sup>5</sup></b>			
Date or Period	LNAPL Volume gallons	Mass Removed pounds	
Current Period (9/30/2017 - TBD)	0.0	0.0	
Previously Reported (5/23/2008 - 9/29/2017)	72.8	485.5	
<b>Total</b>	<b>72.8</b>	<b>485.5</b>	
<b>DNAPL Recovery<sup>6</sup></b>			
Date or Period	DNAPL Volume gallons	Mass Removed pounds	
Historical DNAPL Recovery	3.8	41.2	
<b>Total</b>	<b>3.8</b>	<b>41.2</b>	
<b>Current Quarter Total Mass Removed<sup>7</sup></b>		<b>40.7</b>	
<b>Cumulative Total Mass Removed<sup>8</sup></b>		<b>28,886</b>	

**Notes:**

VOC = volatile organic compound

SVE = soil vapor extraction

µg/L = micrograms per liter

µg/m<sup>3</sup> = micrograms per cubic meter

<sup>1</sup> = Groundwater extraction ICM mass removal is based on volume of groundwater extracted and water treatment system influent VOC concentrations during the reporting period. Previously reported mass removal via groundwater extraction includes the time period from ICM groundwater extraction system startup on March 12, 2002 through the last sampling date of the previous reporting period.

<sup>2</sup> = Total VOC concentrations in samples collected from the groundwater extraction system effluent to the water treatment system (W-1) are from Table B4.

<sup>3</sup> = SVE ICM mass removal is based on the volume of soil vapor extracted and SVE influent VOC concentrations to the vapor treatment system during the reporting period. Previously reported mass removal via SVE includes the time period from the original pilot SVE system startup in 1992 through the last sampling date of the previous reporting period. The pilot scale SVE system was incorporated into the current SVE system in March 2002.

<sup>4</sup> = Total VOC concentrations in soil vapor extraction samples collected from the SVE system effluent to the vapor treatment system (VSP-2) are from Table B6.

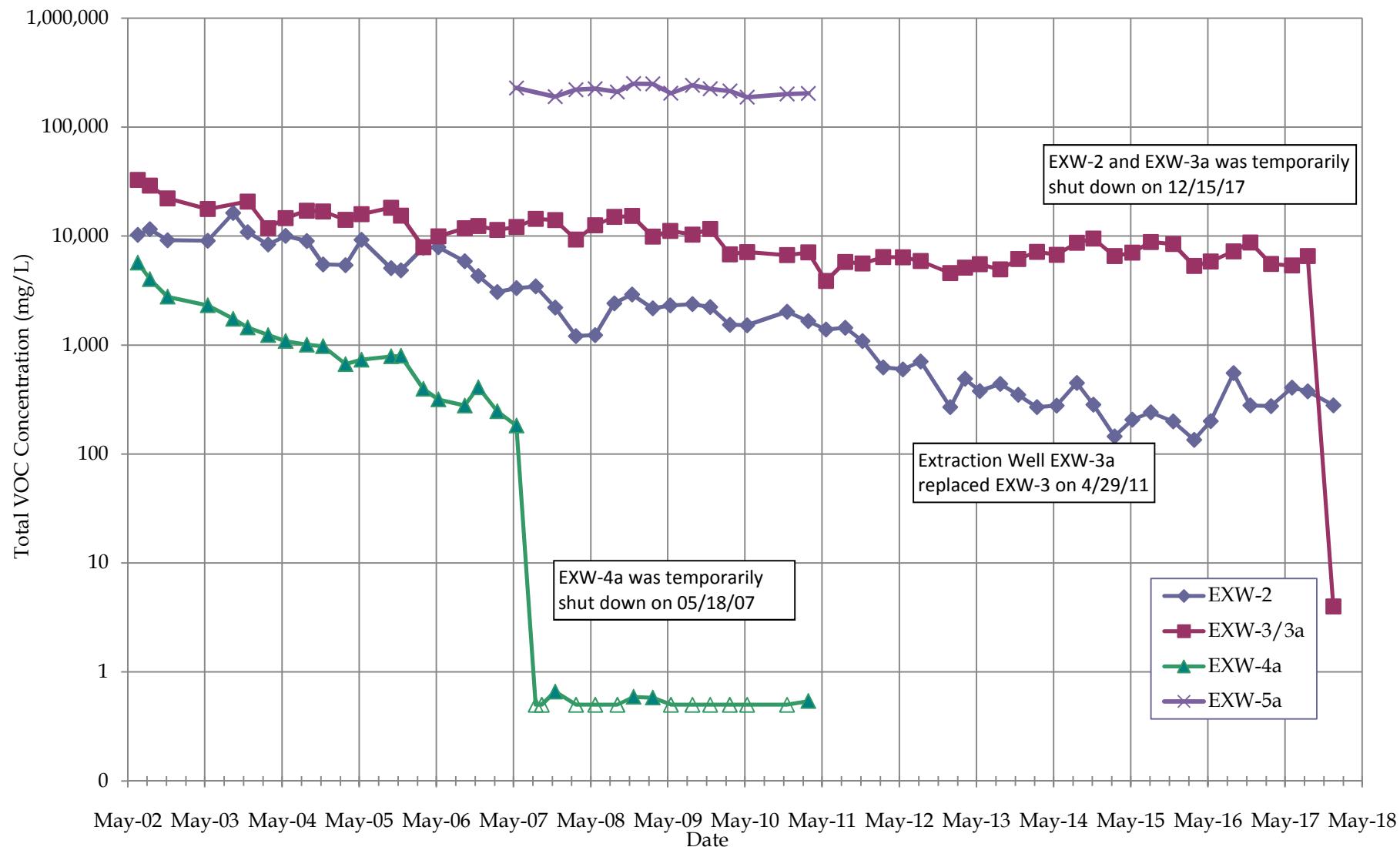
<sup>5</sup> = LNAPL (light non-aqueous phase liquid) recovery mass removal is based on gallons of LNAPL removed during samples collected from SC-6 and SMW-28 on 9/13/2007 and 10/17/2008, respectively. Previously reported mass removal is from the first LNAPL recovery event on May 23, 2008 through the end of last reporting period.

<sup>6</sup> = DNAPL (dense non-aqueous phase liquid) recovery mass removal is based on gallons of DNAPL removed during the reporting period and the specific gravity of DNAPL. DNAPL is assumed to have a specific gravity of 1.3 based on a sample collected from groundwater monitoring well SMW-38. There was no DNAPL recovery during the reporting period.

<sup>7</sup> = The current period's total mass removal is the sum of VOC mass removed by groundwater extraction, soil vapor extraction, LNAPL recovery, and DNAPL recovery during the reporting period in pounds.

<sup>8</sup> = The cumulative total mass removal is the sum of VOC mass removed by groundwater extraction, soil vapor extraction, LNAPL recovery, and DNAPL recovery since 1992 when the original SVE system was started-up in pounds.

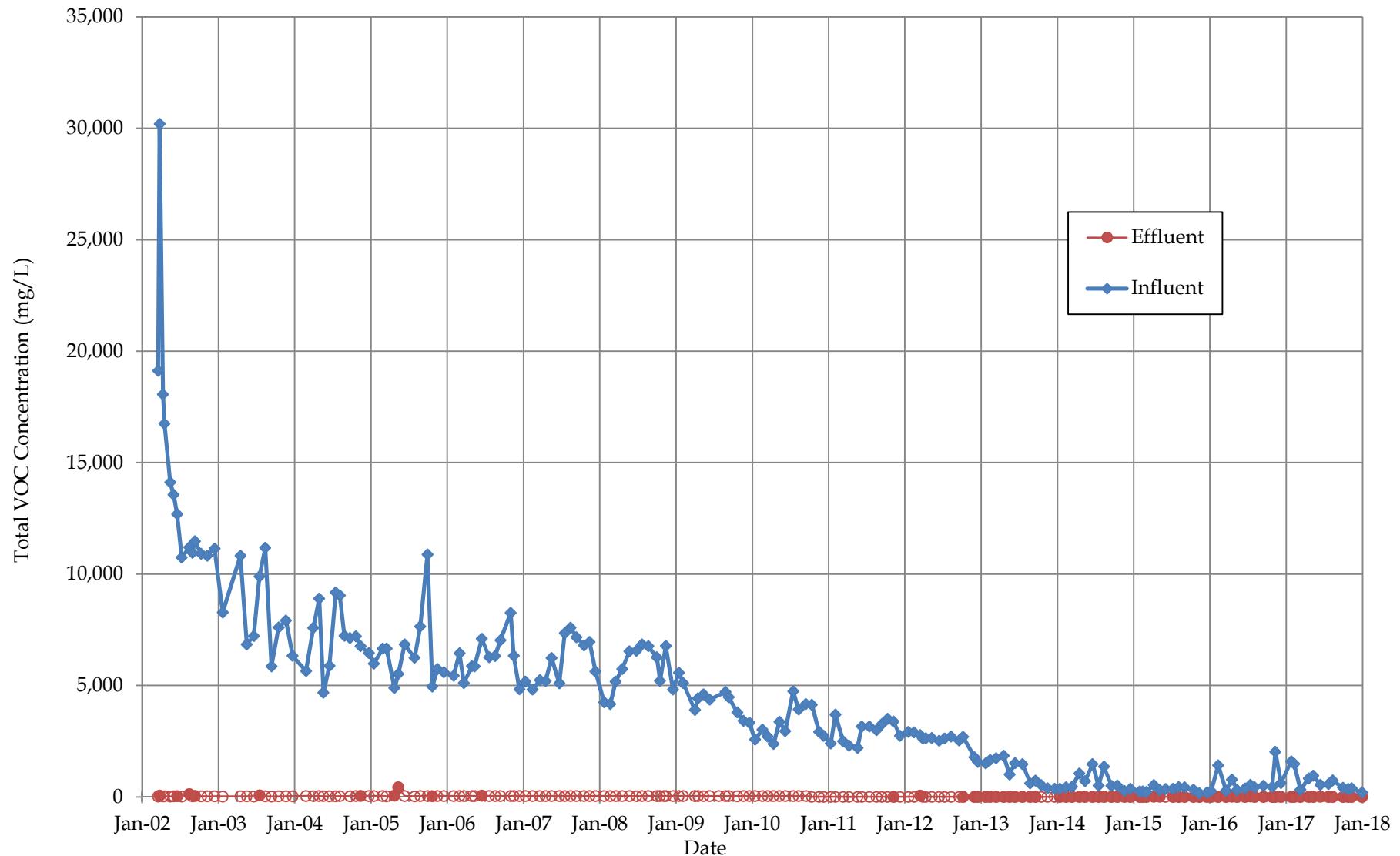
Chart B1  
ICM Groundwater Extraction Well Data - Total VOC Concentrations



**Notes:**

Total VOC concentrations below laboratory method reporting limits (MRLs) are represented by hollow data points.

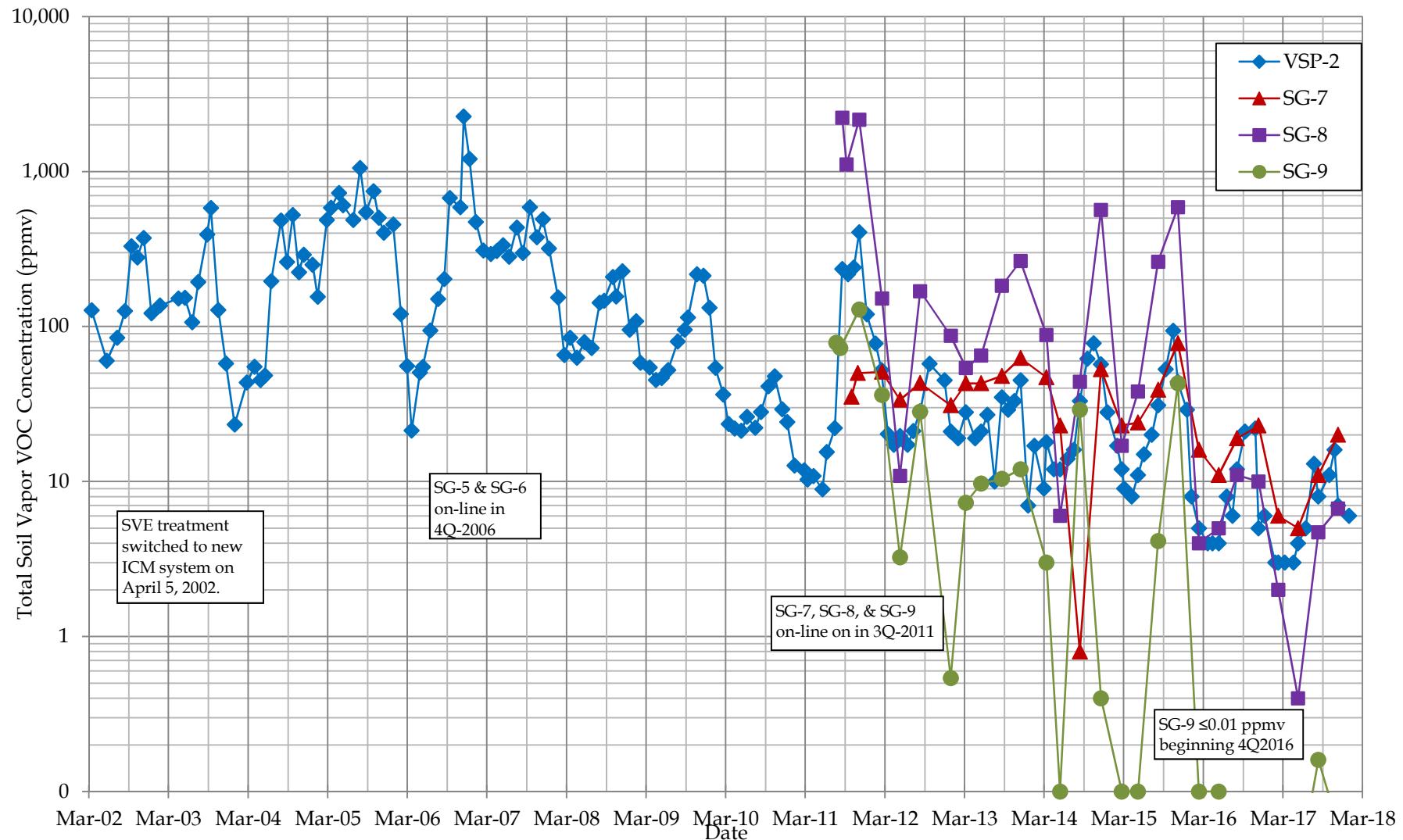
Chart B2  
ICM Water Treatment System Data - Total VOC Concentrations



**Note:**

Total VOC concentrations below laboratory method reporting limits (MRLs) are represented by hollow data points.

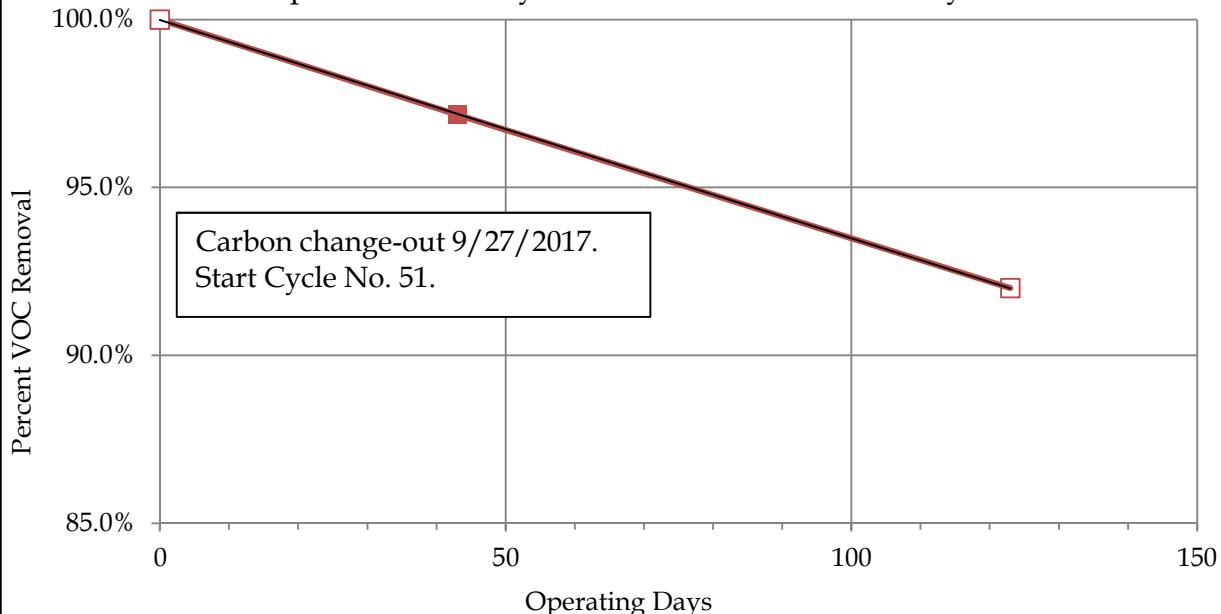
Chart B3  
ICM SVE System Data - Total VOC Concentrations



**Note:**

Historical SVE data from 1989 through 2001 is included on Chart 4 in the 1st Quarter 2007 Progress Report (2007-1), and SVE data for 2001 through the 3rd quarter of 2011 is included in Chart 5 of the

**Chart B4**  
**ICM Vapor Treatment System VOC Removal Efficiency**



Cycle No.	Date	Lab VOCs <sup>1</sup> ( $\mu\text{g/L}$ )		Percent VOC Removal at Stack		Operating Days	Cycle TWA
		Influent <sup>2</sup>	Stack <sup>3</sup>	Lab Data	Projected/Assumed		
51	9/27/2017	--	--	--	100%	0	--
	11/9/2017	22,391	633	97.2%	--	43	97.2%
	1/28/2018	--	--	--	92%	123	--

**Notes:**

Treatment efficiency is calculated as a time weighted average (TWA) of each change-out cycle.

Linear changes in treatment efficiency with operating time is assumed.

The performance of each cycle is assumed to be 100% at the start.

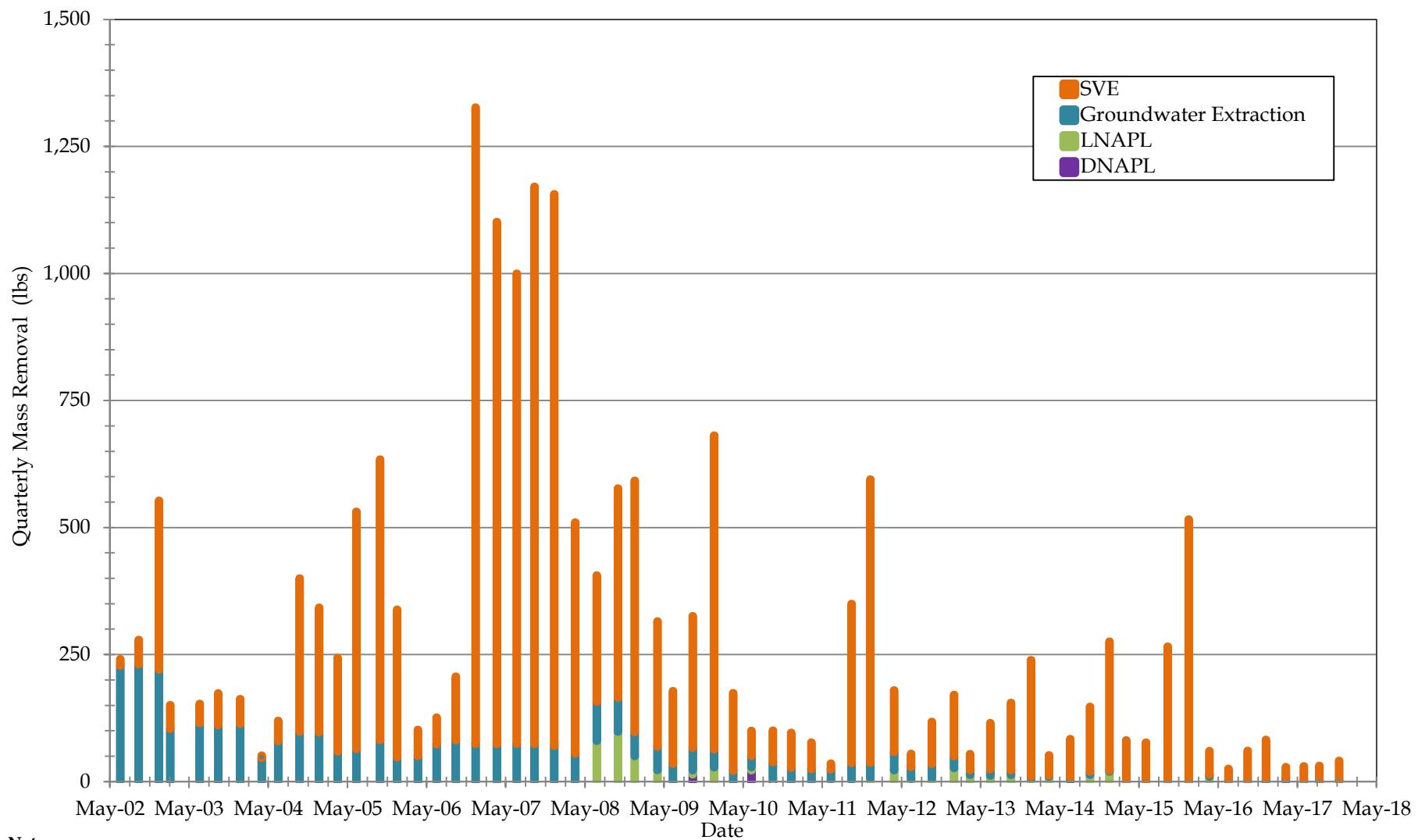
$\mu\text{g/L}$  = micrograms per liter

<sup>1</sup> = Volatile organic compound (VOC) analysis by EPA Method 8260b.

<sup>2</sup> = The Influent sampling point of the vapor treatment system is VSP-3b; this quarter's results are shown in Table B7.

<sup>3</sup> = The Stack sampling point of the vapor treatment system is VSP-5; this quarter's results are shown in Table B7.

Chart B5  
ICM Quarterly Mass Removal



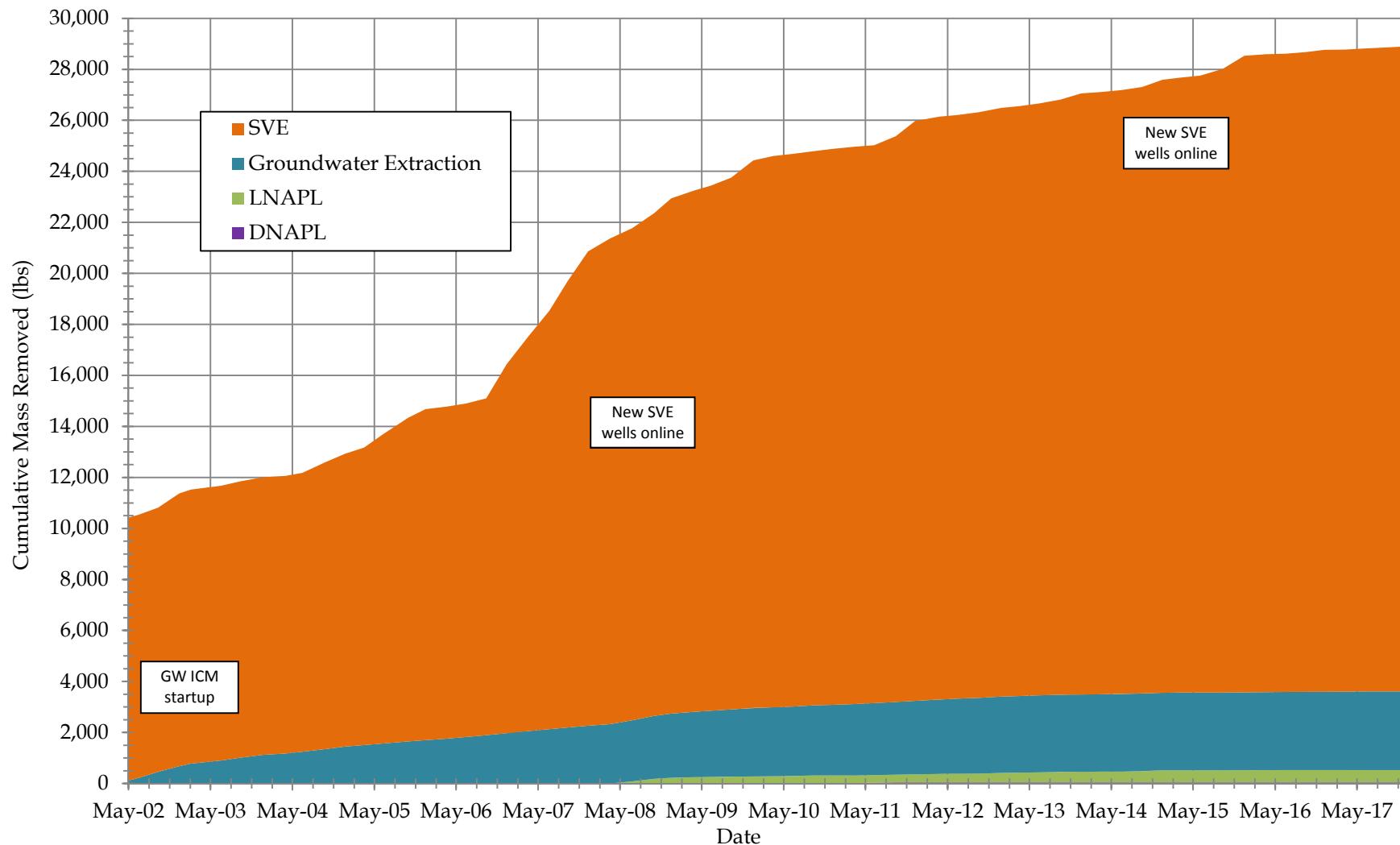
**Notes:**

Groundwater ICM - startup on 3/12/2002.

SVE ICM - operations prior to 3/12/02 removed 10,300 pounds of mass. Start-up new SVE wells: SG-5 and SG-6 in 4Q-2006; and SG-7, SG-8 and SG-9 in 2Q-2011.

LNAPL recovery - began in 2Q-2008 and is ongoing.

Chart B6  
ICM Cumulative Mass Removed



**Notes:**

Groundwater ICM - startup on 3/12/2002.

SVE ICM - operations prior to 3/12/02 removed 10,300 pounds of mass. Start-up new SVE wells SG-5 and SG-6 in 4Q-2006; and startup SG-7, SG-8 and SG-9 in 2Q-2011.

LNAPL recovery - began in 2Q-2008 and is ongoing.

*Appendix C*  
*Laboratory Analytical Data*  
*Reports and Data Validation*  
*Memoranda*

## **APPENDIX C - LABORATORY ANALYTICAL DATA REPORTS AND DATA VALIDATION MEMORANDA**

*<Provided in electronic format only>*

### **LABORATORY ANALYTICAL DATA REPORTS**

<b>Number</b>	<b>Lab ID</b>	<b>Report Reference</b>
01	FA48716	October water treatment system sampling
02	P1705310	October soil vapor extraction system and vapor treatment system sampling
03	FA49466	DMW-7 Investigation groundwater samples
04	P1705714	November soil vapor extraction system and vapor treatment system sampling
05	FA49256	November water treatment system sampling
06	FA50344	December groundwater sampling
07	FA50605	December water treatment system sampling
08	P1800015	December soil vapor extraction system and vapor treatment system sampling

### **DATA VALIDATION MEMORANDA**

*7 November 2017. Data Review of Univar NW Yeon Water Treatment System Samples Collected 24 October 2017. SGS Accutest Data Package FA48716. ERM.*

*14 November 2017. Data Review of Univar NW Yeon Soil Vapor Extraction Samples Collected 24 October 2017. ALS Data Package P1705310. ERM.*

*30 November 2017. Data Review of Univar Portland NW Yeon Groundwater Samples Collected 16 November 2017. SGS Accutest Data Package FA49466. ERM.*

*7 December 2017. Data Review Univar NW Yeon Soil Vapor Extraction Samples Collected 9 November 2017. ALS Data Package P1705714. ERM*

*6 November 2017. Data Review of Univar NW Yeon Water Treatment System Samples Collected 09 November 2017. SGS Accutest Data Package FA49256. ERM.*

*15 January 2018. Data Review of Univar Portland NW Yeon Groundwater Samples Collected 13-15 December 2017. SGS Accutest Data Package FA50344. ERM*

*11 January 2018. Data Review of Univar NW Yeon Water Treatment System Samples Collected 29 December 2017. SGS Accutest Data Package FA50605. ERM.*

*12 January 2018. Data Review of Univar NW Yeon Soil Vapor Extraction Samples Collected 29 December 2017. ALS Data Package P1800015. ERM.*



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Automated Report

## Technical Report for

Univar

ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
S074

SGS Accutest Job Number: FA48716

Sampling Date: 10/24/17



Report to:

ERM  
1001 SW 5th Ave Suite 1010  
Portland, OR 97204  
Brendan.Robinson@erm.com; Dylan.Stankus@erm.com;  
tanya.battye@erm.com  
ATTN: Brendan Robinson

Total number of pages in report: 33



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Elvin Kumar 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(L-A-B L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, GA, IA, KY, MA, NV, OK, OR, UT, WA

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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Summary of Hits .....</b>	<b>5</b>
<b>Section 4: Sample Results .....</b>	<b>6</b>
<b>4.1: FA48716-1: W-1-20171024 .....</b>	<b>7</b>
<b>4.2: FA48716-2: W-2-20171024 .....</b>	<b>9</b>
<b>4.3: FA48716-3: TRIP BLANK .....</b>	<b>12</b>
<b>Section 5: Misc. Forms .....</b>	<b>14</b>
<b>5.1: Chain of Custody .....</b>	<b>15</b>
<b>Section 6: MS Volatiles - QC Data Summaries .....</b>	<b>17</b>
<b>6.1: Method Blank Summary .....</b>	<b>18</b>
<b>6.2: Blank Spike Summary .....</b>	<b>22</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>26</b>
<b>Section 7: General Chemistry - QC Data Summaries .....</b>	<b>30</b>
<b>7.1: Method Blank and Spike Results Summary .....</b>	<b>31</b>
<b>7.2: Matrix Spike Results Summary .....</b>	<b>32</b>
<b>7.3: Matrix Spike Duplicate Results Summary .....</b>	<b>33</b>



## Sample Summary

Univar

Job No: FA48716

ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA48716-1	10/24/17	06:51	10/25/17	AQ Water	W-1-20171024
FA48716-2	10/24/17	07:05	10/25/17	AQ Water	W-2-20171024
FA48716-3	10/24/17	00:00	10/25/17	AQ Trip Blank Water	TRIP BLANK

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Univar

**Job No:** FA48716

**Site:** ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR **Report Date** 11/6/2017 5:08:48 PM

2 Sample(s), 1 Trip Blank(s) were collected on 10/24/2017 and were received at SGS Accutest Southeast (SASE) on 10/25/2017 properly preserved, at 3 Deg. C and intact. These Samples received an SASE job number of FA48716. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VP2026

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA48667-4MS, FA48667-4MSD were used as the QC samples indicated.

Matrix Spike/ Matrix Spike Duplicate Recovery(s) for 2-Chloroethyl Vinyl Ether, Styrene are outside control limits. Probable cause is due to matrix interference. % RPD was within control limits in MS/MSD.

FA48716-3: Sample was not preserved to a pH < 2.

**Matrix:** AQ

**Batch ID:** VP2027

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA48784-18MS, FA48784-18MSD were used as the QC samples indicated.

FA48716-1: Sample was not preserved to a pH < 2.

FA48716-2: Sample was not preserved to a pH < 2.

### General Chemistry By Method EPA 1664A

**Matrix:** AQ

**Batch ID:** GP30544

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA48792-1MS were used as the QC samples for HEM Oil and Grease.

Blank Spike Recovery(s) for HEM Oil and Grease are outside control limits. Recovery above upper control limit, but sample was ND.

Matrix Spike Recovery(s) for HEM Oil and Grease are outside control limits. Probable cause is due to matrix interference.

FA48716-2 for HEM Oil and Grease: Associated BS recovery above control limits; data not adversely affected.

### General Chemistry By Method EPA 335.4/SW 9012B

**Matrix:** AQ

**Batch ID:** GP30518

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) LA38109-2MSD, LA38109-2MS were used as the QC samples for Cyanide, Total.

Matrix Spike Recovery(s) for Cyanide, Total are outside control limits. Probable cause is due to matrix interference.

RPD(s) for MSD for Cyanide, Total are outside control limits for sample GP30518-S2. High RPD due to matrix interference.

SGS Accutest (SASE) certifies that this report meets the project requirements for analytical data produced for the samples as received at SASE and as stated on the COC. SASE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SASE Quality Manual except as noted above. This report is to be used in its entirety. SASE is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

---

Kim Benham, Client Services (signature on file)

## Summary of Hits

Page 1 of 1

Job Number: FA48716

Account: Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Collected: 10/24/17

3

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
---------------	------------------	-----------------	----	-----	-------	--------

### FA48716-1 W-1-20171024

Benzene <sup>a</sup>	2.4	1.0	0.31	ug/l	SW846 8260B
Chloroethane <sup>a</sup>	42.5	2.0	0.67	ug/l	SW846 8260B
1,2-Dichlorobenzene <sup>a</sup>	0.63 J	1.0	0.32	ug/l	SW846 8260B
1,1-Dichloroethane <sup>a</sup>	19.9	1.0	0.34	ug/l	SW846 8260B
1,1-Dichloroethylene <sup>a</sup>	0.88 J	1.0	0.32	ug/l	SW846 8260B
cis-1,2-Dichloroethylene <sup>a</sup>	50.3	1.0	0.28	ug/l	SW846 8260B
trans-1,2-Dichloroethylene <sup>a</sup>	0.81 J	1.0	0.22	ug/l	SW846 8260B
Ethylbenzene <sup>a</sup>	73.5	1.0	0.36	ug/l	SW846 8260B
Toluene <sup>a</sup>	11.1	1.0	0.30	ug/l	SW846 8260B
1,1,1-Trichloroethane <sup>a</sup>	7.2	1.0	0.25	ug/l	SW846 8260B
Vinyl Chloride <sup>a</sup>	50.5	1.0	0.41	ug/l	SW846 8260B
m,p-Xylene <sup>a</sup>	56.6	2.0	0.47	ug/l	SW846 8260B
o-Xylene <sup>a</sup>	17.7	1.0	0.26	ug/l	SW846 8260B

### FA48716-2 W-2-20171024

Cyanide, Total	0.0040 J	0.010	0.0030	mg/l	EPA 335.4/SW 9012B
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### FA48716-3 TRIP BLANK

No hits reported in this sample.

(a) Sample was not preserved to a pH < 2.



Sample Results

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Report of Analysis

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**Report of Analysis**

Page 1 of 2

<b>Client Sample ID:</b>	W-1-20171024	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-1	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	P53346.D	1	10/28/17 15:39	AJ	n/a	n/a	VP2027
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	2.4	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	42.5	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.63	1.0	0.32	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	19.9	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.88	1.0	0.32	ug/l	J
156-59-2	cis-1,2-Dichloroethylene	50.3	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.81	1.0	0.22	ug/l	J
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	73.5	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-1-20171024	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-1	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	11.1	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	7.2	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	50.5	1.0	0.41	ug/l	
	m,p-Xylene	56.6	2.0	0.47	ug/l	
95-47-6	o-Xylene	17.7	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		83-118%
17060-07-0	1,2-Dichloroethane-D4	101%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	101%		83-118%

(a) Sample was not preserved to a pH &lt; 2.

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.2  
4**Client Sample ID:** W-2-20171024**Lab Sample ID:** FA48716-2**Date Sampled:** 10/24/17**Matrix:** AQ - Water**Date Received:** 10/25/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	P53347.D	1	10/28/17 16:03	AJ	n/a	n/a	VP2027
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-2-20171024	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-2	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		83-118%
17060-07-0	1,2-Dichloroethane-D4	102%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	101%		83-118%

(a) Sample was not preserved to a pH &lt; 2.

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b>	W-2-20171024	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-2	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By Method
Cyanide, Total	0.0040 J	0.010	0.0030	mg/l	1	10/26/17 15:20 JK	EPA 335.4/SW 9012B
HEM Oil and Grease <sup>a</sup>	1.4 U	4.9	1.4	mg/l	1	10/31/17 10:25 CH	EPA 1664A

(a) Associated BS recovery above control limits; data not adversely affected.

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 J = Indicates a result > = MDL but < RL

**Report of Analysis**

Page 1 of 2

4.3  
4

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-3	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	P53335.D	1	10/27/17 19:45	AJ	n/a	n/a	VP2026
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	10/24/17
<b>Lab Sample ID:</b>	FA48716-3	<b>Date Received:</b>	10/25/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	102%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	100%		83-118%

(a) Sample was not preserved to a pH &lt; 2.

ND = Not detected      MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Misc. Forms**

5

**Custody Documents and Other Forms**

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Includes the following where applicable:

- Chain of Custody

**UNIVAR FA48716**

Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/888-8716 Fax 425/888-4188

Univar Chain of Custody/Laboratory Analysis Request Form

Page 1 of 1

Bill to: Mark Metcalf  
Univar USA  
17425 NE Union Hill Rd  
Redmond WA 98052

Lab Name: Accutest  
Address: Orlando, FL  
Telephone: 407-425-6700

REMARKS:

1 trip blank = 2 preserved VOC's

+ 2 unpreserved VOC's

Univar Project Site: <b>PORTLAND, OR (NW YARD) Po #8074</b>				NUMBER OF CONTAINERS					
Contractor Project Manager: <b>BRENDAN ROBISON</b>									
Firm: ERM Address: 1001 SW 5TH AVE, SUITE 1910 Portland, OR 97204 Tel: (503) 488-5282									
Sampler's Signature:									
SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	Acrolein + AcETE	Cyanide	VOCs		
W-1-2017024	10/24	0851		Water	6 X	X			
W-2-2017024	10/24	0705			9 X	X	X		
Trip Blank					1 X		X		
Relinquished by/date: <i>10/24/17</i>				Invoice Instructions - Univar to provide to Sampler (Circle code, if multiple codes apply, note in Remarks)				SPECIAL INSTRUCTIONS & COMMENTS: Fax copy of lab results to Enviro Affairs Dept., 425/888-4188	
Received by/date: <i>10/25/17 9AM</i>				#041				EMAIL RESULTS TO: <b>BRENDAN.ROBISON@ERM.COM</b> , <b>DYLAN.STANIEWS@ERM.COM</b>	
Relinquished by/date: <i>10/25/17 9AM</i>				Soil Investigation/Remediation 086, 133 or 068, 156					
Received by/date: <i>10/25/17 9AM</i>				Water Investigation/Remediation 047, 146 or 165, 197					
Relinquished by/date: <i>10/25/17 9AM</i>				Air-Soil Investigation or Remediation 094 or 087					
Received by/date: <i>10/25/17 9AM</i>				Waste 171					
REPORT REQUIREMENTS: (check) <input checked="" type="checkbox"/> Routine Report <input type="checkbox"/> II. Report <input type="checkbox"/> III. Data Validation Report <input type="checkbox"/> IV. OLP Deliverable Report									
//Requested Report Date:									
TURNAROUND TIME: <input type="checkbox"/> 24 hr <input type="checkbox"/> 48 hr <input type="checkbox"/> 5 day <input checked="" type="checkbox"/> Standard (7-10 working days)								Provide Verbal Prelim. Results <input type="checkbox"/>	Fax Prelim. Results <input type="checkbox"/>

3.0

FA48716: Chain of Custody

Page 1 of 2

# SGS Accutest Sample Receipt Summary

Job Number: FA48716 Client: ERM Project: Univar NW Yeon  
 Date / Time Received: 10/25/2017 9:00:00 AM Delivery Method: FedEx Airbill #'s: 810413402924

Therm ID: IR 1;	Therm CF: -0.2;	# of Coolers: 1
Cooler Temps (Raw Measured) °C: Cooler 1: (3.2);		
Cooler Temps (Corrected) °C: Cooler 1: (3.0);		

<b>Cooler Information</b>		<b>Y or N</b>	<b>Sample Information</b>		<b>Y or N</b>	<b>N/A</b>
1. Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. Sample labels present on bottles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Custody Seals Intact	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. Samples preserved properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Temp criteria achieved	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Sufficient volume/containers recvd for analysis:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4. Cooler temp verification	IR Gun		4. Condition of sample	Broken / Leaking		
5. Cooler media	Ice (Bag)		5. Sample recvd within HT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Trip Blank Information</b>		<b>Y or N</b>	6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
1. Trip Blank present / cooler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. VOCs have headspace	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
		<b>W or S</b>	9. Compositing instructions clear	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Type Of TB Received	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			11. % Solids Jar received?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
			12. Residual Chlorine Present?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Misc. Information</b>			
Number of Encores: 25-Gram _____	5-Gram _____	Number of 5035 Field Kits: _____	Number of Lab Filtered Metals: _____
Test Strip Lot #: pH 0-3 _____	pH 10-12 _____	pH 10-12 _____	Other: (Specify) _____
Residual Chlorine Test Strip Lot #: _____			
Comments SAMPLE #1 -1 HCL VIAL REC'D BROKEN.			

SM001  
 Rev. Date 05/24/17

Technician: SHAYLAP Date: 10/25/2017 9:00:00 A Reviewer: CR Date: 10/25/2017

**FA48716: Chain of Custody**  
**Page 2 of 2**

**MS Volatiles****QC Data Summaries**

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 2

Job Number: FA48716

Account: UNIVAR Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2026-MB	P53314.D	1	10/27/17	AJ	n/a	n/a	VP2026

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-3

CAS No.	Compound	Result	RL	MDL	Units	Q
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	

## Method Blank Summary

Page 2 of 2

**Job Number:** FA48716  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Wate

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2026-MB	P53314.D	1	10/27/17	AJ	n/a	n/a	VP2026

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

FA48716-3

CAS No.	Compound	Result	RL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99%
17060-07-0	1,2-Dichloroethane-D4	101%
2037-26-5	Toluene-D8	99%
460-00-4	4-Bromofluorobenzene	101%

## Method Blank Summary

Page 1 of 2

Job Number: FA48716  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2027-MB	P53344.D	1	10/28/17	AJ	n/a	n/a	VP2027

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-1, FA48716-2

6.1.2  
6

CAS No.	Compound	Result	RL	MDL	Units	Q
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	

**Method Blank Summary**

Job Number: FA48716

Account: UNIVAR Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2027-MB	P53344.D	1	10/28/17	AJ	n/a	n/a	VP2027

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA48716-1, FA48716-2

6.1.2  
6

CAS No.	Compound	Result	RL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

**CAS No. Surrogate Recoveries Limits**

1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	100%	79-125%
2037-26-5	Toluene-D8	100%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
124-38-9	Carbon dioxide Total TIC, Volatile	2.26	1400 0	ug/l ug/l	JN

## Blank Spike Summary

Page 1 of 2

Job Number: FA48716  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2026-BS	P53313.D	1	10/27/17	AJ	n/a	n/a	VP2026

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
107-02-8	Acrolein	125	126	101	31-154
107-13-1	Acrylonitrile	125	126	101	58-126
71-43-2	Benzene	25	28.8	115	81-122
75-27-4	Bromodichloromethane	25	25.6	102	79-123
75-25-2	Bromoform	25	25.2	101	66-123
75-15-0	Carbon Disulfide	25	28.2	113	66-148
56-23-5	Carbon Tetrachloride	25	26.3	105	76-136
108-90-7	Chlorobenzene	25	27.5	110	82-124
75-00-3	Chloroethane	25	32.0	128	62-144
110-75-8	2-Chloroethyl Vinyl Ether	125	126	101	56-122
67-66-3	Chloroform	25	25.6	102	80-124
124-48-1	Dibromochloromethane	25	25.6	102	78-122
75-71-8	Dichlorodifluoromethane	25	22.6	90	42-167
95-50-1	1,2-Dichlorobenzene	25	26.7	107	82-124
541-73-1	1,3-Dichlorobenzene	25	28.0	112	84-125
106-46-7	1,4-Dichlorobenzene	25	27.1	108	78-120
75-34-3	1,1-Dichloroethane	25	30.6	122	81-122
107-06-2	1,2-Dichloroethane	25	27.5	110	75-125
75-35-4	1,1-Dichloroethylene	25	28.6	114	78-137
156-59-2	cis-1,2-Dichloroethylene	25	28.4	114	78-120
156-60-5	trans-1,2-Dichloroethylene	25	30.2	121	76-127
78-87-5	1,2-Dichloropropane	25	27.2	109	76-124
10061-01-5	cis-1,3-Dichloropropene	25	23.6	94	75-118
10061-02-6	trans-1,3-Dichloropropene	25	25.3	101	80-120
100-41-4	Ethylbenzene	25	28.8	115	81-121
76-13-1	Freon 113	25	24.7	99	72-134
74-83-9	Methyl Bromide	25	26.9	108	59-143
74-87-3	Methyl Chloride	25	25.9	104	50-159
75-09-2	Methylene Chloride	25	28.0	112	69-135
100-42-5	Styrene	25	24.2	97	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	26.1	104	72-120
127-18-4	Tetrachloroethylene	25	28.6	114	76-135
108-88-3	Toluene	25	28.2	113	80-120
71-55-6	1,1,1-Trichloroethane	25	25.1	100	75-130
79-00-5	1,1,2-Trichloroethane	25	26.1	104	76-119
79-01-6	Trichloroethylene	25	28.9	116	81-126

\* = Outside of Control Limits.

**Blank Spike Summary**

**Job Number:** FA48716  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2026-BS	P53313.D	1	10/27/17	AJ	n/a	n/a	VP2026

**The QC reported here applies to the following samples:****Method:** SW846 8260B

FA48716-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-69-4	Trichlorofluoromethane	25	28.5	114	71-156
75-01-4	Vinyl Chloride	25	25.9	104	69-159
	m,p-Xylene	50	59.8	120	79-126
95-47-6	o-Xylene	25	27.8	111	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	83-118%
17060-07-0	1,2-Dichloroethane-D4	106%	79-125%
2037-26-5	Toluene-D8	99%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA48716  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2027-BS	P53343.D	1	10/28/17	AJ	n/a	n/a	VP2027

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-1, FA48716-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
107-02-8	Acrolein	125	123	98	31-154
107-13-1	Acrylonitrile	125	121	97	58-126
71-43-2	Benzene	25	27.9	112	81-122
75-27-4	Bromodichloromethane	25	25.1	100	79-123
75-25-2	Bromoform	25	24.4	98	66-123
75-15-0	Carbon Disulfide	25	26.8	107	66-148
56-23-5	Carbon Tetrachloride	25	25.5	102	76-136
108-90-7	Chlorobenzene	25	26.7	107	82-124
75-00-3	Chloroethane	25	30.7	123	62-144
110-75-8	2-Chloroethyl Vinyl Ether	125	122	98	56-122
67-66-3	Chloroform	25	24.7	99	80-124
124-48-1	Dibromochloromethane	25	24.5	98	78-122
75-71-8	Dichlorodifluoromethane	25	21.0	84	42-167
95-50-1	1,2-Dichlorobenzene	25	25.8	103	82-124
541-73-1	1,3-Dichlorobenzene	25	27.3	109	84-125
106-46-7	1,4-Dichlorobenzene	25	26.7	107	78-120
75-34-3	1,1-Dichloroethane	25	29.7	119	81-122
107-06-2	1,2-Dichloroethane	25	27.1	108	75-125
75-35-4	1,1-Dichloroethylene	25	27.4	110	78-137
156-59-2	cis-1,2-Dichloroethylene	25	27.6	110	78-120
156-60-5	trans-1,2-Dichloroethylene	25	29.5	118	76-127
78-87-5	1,2-Dichloropropane	25	26.5	106	76-124
10061-01-5	cis-1,3-Dichloropropene	25	23.1	92	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.3	97	80-120
100-41-4	Ethylbenzene	25	28.2	113	81-121
76-13-1	Freon 113	25	23.5	94	72-134
74-83-9	Methyl Bromide	25	25.7	103	59-143
74-87-3	Methyl Chloride	25	24.7	99	50-159
75-09-2	Methylene Chloride	25	27.2	109	69-135
100-42-5	Styrene	25	23.3	93	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	24.2	97	72-120
127-18-4	Tetrachloroethylene	25	28.1	112	76-135
108-88-3	Toluene	25	27.6	110	80-120
71-55-6	1,1,1-Trichloroethane	25	24.2	97	75-130
79-00-5	1,1,2-Trichloroethane	25	25.2	101	76-119
79-01-6	Trichloroethylene	25	28.2	113	81-126

\* = Outside of Control Limits.

**Blank Spike Summary**

**Job Number:** FA48716  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2027-BS	P53343.D	1	10/28/17	AJ	n/a	n/a	VP2027

**The QC reported here applies to the following samples:****Method:** SW846 8260B

FA48716-1, FA48716-2

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-69-4	Trichlorofluoromethane	25	27.1	108	71-156
75-01-4	Vinyl Chloride	25	25.4	102	69-159
	m,p-Xylene	50	58.1	116	79-126
95-47-6	o-Xylene	25	27.0	108	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	105%	79-125%
2037-26-5	Toluene-D8	98%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FA48716  
 Account: UNIVAR Univar  
 Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48667-4MS	P53325.D	1	10/27/17	AJ	n/a	n/a	VP2026
FA48667-4MSD	P53326.D	1	10/27/17	AJ	n/a	n/a	VP2026
FA48667-4	P53319.D	1	10/27/17	AJ	n/a	n/a	VP2026

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-3

CAS No.	Compound	FA48667-4		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
107-02-8	Acrolein	ND	125	102	82	125	109	87	7	31-154/29	
107-13-1	Acrylonitrile	ND	125	106	85	125	108	86	2	58-126/16	
71-43-2	Benzene	ND	25	27.4	110	25	27.7	111	1	81-122/14	
75-27-4	Bromodichloromethane	ND	25	23.1	92	25	23.5	94	2	79-123/19	
75-25-2	Bromoform	ND	25	19.6	78	25	19.7	79	1	66-123/21	
75-15-0	Carbon Disulfide	ND	25	22.0	88	25	23.0	92	4	66-148/23	
56-23-5	Carbon Tetrachloride	ND	25	24.6	98	25	25.0	100	2	76-136/23	
108-90-7	Chlorobenzene	ND	25	26.6	106	25	26.6	106	0	82-124/14	
75-00-3	Chloroethane	ND	25	28.8	115	25	30.7	123	6	62-144/20	
110-75-8	2-Chloroethyl Vinyl Ether	ND	125	ND	0*	125	ND	0*	nc	56-122/23	
67-66-3	Chloroform	ND	25	24.1	96	25	24.5	98	2	80-124/15	
124-48-1	Dibromochloromethane	ND	25	21.1	84	25	21.2	85	0	78-122/19	
75-71-8	Dichlorodifluoromethane	ND	25	20.4	82	25	22.3	89	9	42-167/19	
95-50-1	1,2-Dichlorobenzene	ND	25	25.8	103	25	25.8	103	0	82-124/14	
541-73-1	1,3-Dichlorobenzene	ND	25	27.0	108	25	27.1	108	0	84-125/14	
106-46-7	1,4-Dichlorobenzene	ND	25	25.9	104	25	26.1	104	1	78-120/15	
75-34-3	1,1-Dichloroethane	ND	25	28.0	112	25	28.9	116	3	81-122/15	
107-06-2	1,2-Dichloroethane	ND	25	26.6	106	25	26.3	105	1	75-125/14	
75-35-4	1,1-Dichloroethylene	ND	25	25.5	102	25	26.4	106	3	78-137/18	
156-59-2	cis-1,2-Dichloroethylene	ND	25	27.1	108	25	27.3	109	1	78-120/15	
156-60-5	trans-1,2-Dichloroethylene	ND	25	27.0	108	25	28.2	113	4	76-127/17	
78-87-5	1,2-Dichloropropane	ND	25	25.2	101	25	25.4	102	1	76-124/14	
10061-01-5	cis-1,3-Dichloropropene	ND	25	21.3	85	25	21.5	86	1	75-118/23	
10061-02-6	trans-1,3-Dichloropropene	ND	25	22.9	92	25	22.8	91	0	80-120/22	
100-41-4	Ethylbenzene	ND	25	27.7	111	25	27.6	110	0	81-121/14	
76-13-1	Freon 113	ND	25	22.2	89	25	23.1	92	4	72-134/20	
74-83-9	Methyl Bromide	ND	25	24.8	99	25	25.9	104	4	59-143/19	
74-87-3	Methyl Chloride	ND	25	21.2	85	25	22.9	92	8	50-159/19	
75-09-2	Methylene Chloride	ND	25	25.8	103	25	26.3	105	2	69-135/16	
100-42-5	Styrene	ND	25	15.5	62*	25	16.3	65*	5	78-119/23	
79-34-5	1,1,2,2-Tetrachloroethane	ND	25	24.7	99	25	25.0	100	1	72-120/14	
127-18-4	Tetrachloroethylene	ND	25	22.6	90	25	22.5	90	0	76-135/16	
108-88-3	Toluene	ND	25	26.5	106	25	26.4	106	0	80-120/14	
71-55-6	1,1,1-Trichloroethane	ND	25	23.2	93	25	23.9	96	3	75-130/16	
79-00-5	1,1,2-Trichloroethane	ND	25	24.4	98	25	24.2	97	1	76-119/14	
79-01-6	Trichloroethylene	ND	25	28.1	112	25	28.5	114	1	81-126/15	

\* = Outside of Control Limits.

6.3.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA48716  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48667-4MS	P53325.D	1	10/27/17	AJ	n/a	n/a	VP2026
FA48667-4MSD	P53326.D	1	10/27/17	AJ	n/a	n/a	VP2026
FA48667-4	P53319.D	1	10/27/17	AJ	n/a	n/a	VP2026

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-3

CAS No.	Compound	FA48667-4		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-69-4	Trichlorofluoromethane	ND		25	27.0	108	25	28.3	113	5	71-156/21
75-01-4	Vinyl Chloride	ND		25	22.0	88	25	24.7	99	12	69-159/18
	m,p-Xylene	ND		50	54.9	110	50	55.3	111	1	79-126/15
95-47-6	o-Xylene	ND		25	25.3	101	25	25.5	102	1	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA48667-4	Limits
1868-53-7	Dibromofluoromethane	101%	101%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	104%	99%	79-125%
2037-26-5	Toluene-D8	96%	96%	96%	85-112%
460-00-4	4-Bromofluorobenzene	98%	98%	99%	83-118%

\* = Outside of Control Limits.

6.3.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FA48716  
 Account: UNIVAR Univar  
 Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48784-18MS	P53351.D	1	10/28/17	AJ	n/a	n/a	VP2027
FA48784-18MSD	P53352.D	1	10/28/17	AJ	n/a	n/a	VP2027
FA48784-18 a	P53350.D	1	10/28/17	AJ	n/a	n/a	VP2027

The QC reported here applies to the following samples:

Method: SW846 8260B

FA48716-1, FA48716-2

CAS No.	Compound	FA48784-18		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
107-02-8	Acrolein	20	U	125	114	91	125	112	90	2	31-154/29
107-13-1	Acrylonitrile	10	U	125	120	96	125	120	96	0	58-126/16
71-43-2	Benzene	1.0	U	25	28.5	114	25	28.4	114	0	81-122/14
75-27-4	Bromodichloromethane	1.0	U	25	25.3	101	25	25.2	101	0	79-123/19
75-25-2	Bromoform	1.0	U	25	24.1	96	25	24.2	97	0	66-123/21
75-15-0	Carbon Disulfide	2.0	U	25	23.6	94	25	23.2	93	2	66-148/23
56-23-5	Carbon Tetrachloride	1.0	U	25	25.2	101	25	25.5	102	1	76-136/23
108-90-7	Chlorobenzene	1.0	U	25	27.1	108	25	27.3	109	1	82-124/14
75-00-3	Chloroethane	3.6		25	33.1	118	25	35.1	126	6	62-144/20
110-75-8	2-Chloroethyl Vinyl Ether	5.0	U	125	124	99	125	127	102	2	56-122/23
67-66-3	Chloroform	1.0	U	25	25.2	101	25	25.1	100	0	80-124/15
124-48-1	Dibromochloromethane	1.0	U	25	24.5	98	25	24.5	98	0	78-122/19
75-71-8	Dichlorodifluoromethane	2.0	U	25	20.6	82	25	22.2	89	7	42-167/19
95-50-1	1,2-Dichlorobenzene	1.0	U	25	26.7	107	25	26.6	106	0	82-124/14
541-73-1	1,3-Dichlorobenzene	1.0	U	25	27.8	111	25	28.0	112	1	84-125/14
106-46-7	1,4-Dichlorobenzene	1.0	U	25	26.9	108	25	26.8	107	0	78-120/15
75-34-3	1,1-Dichloroethane	0.71	J	25	30.2	118	25	30.4	119	1	81-122/15
107-06-2	1,2-Dichloroethane	1.0	U	25	27.4	110	25	27.6	110	1	75-125/14
75-35-4	1,1-Dichloroethylene	1.0	U	25	26.5	106	25	27.0	108	2	78-137/18
156-59-2	cis-1,2-Dichloroethylene	7.0		25	35.2	113	25	35.5	114	1	78-120/15
156-60-5	trans-1,2-Dichloroethylene	0.50	J	25	29.0	114	25	29.7	117	2	76-127/17
78-87-5	1,2-Dichloropropane	1.0	U	25	26.6	106	25	26.7	107	0	76-124/14
10061-01-5	cis-1,3-Dichloropropene	1.0	U	25	21.9	88	25	22.1	88	1	75-118/23
10061-02-6	trans-1,3-Dichloropropene	1.0	U	25	23.0	92	25	23.2	93	1	80-120/22
100-41-4	Ethylbenzene	1.0	U	25	28.9	116	25	28.9	116	0	81-121/14
76-13-1	Freon 113	1.0	U	25	23.0	92	25	23.5	94	2	72-134/20
74-83-9	Methyl Bromide	2.0	U	25	24.8	99	25	25.2	101	2	59-143/19
74-87-3	Methyl Chloride	2.0	U	25	25.1	100	25	26.8	107	7	50-159/19
75-09-2	Methylene Chloride	5.0	U	25	26.8	107	25	27.2	109	1	69-135/16
100-42-5	Styrene	1.0	U	25	23.8	95	25	24.1	96	1	78-119/23
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U	25	25.4	102	25	26.3	105	3	72-120/14
127-18-4	Tetrachloroethylene	1.0	U	25	23.6	94	25	23.5	94	0	76-135/16
108-88-3	Toluene	0.64	J	25	28.2	110	25	28.4	111	1	80-120/14
71-55-6	1,1,1-Trichloroethane	1.0	U	25	24.3	97	25	24.3	97	0	75-130/16
79-00-5	1,1,2-Trichloroethane	1.0	U	25	25.3	101	25	25.6	102	1	76-119/14
79-01-6	Trichloroethylene	1.0	U	25	29.3	117	25	28.8	115	2	81-126/15

\* = Outside of Control Limits.

6.3.2

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA48716  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48784-18MS	P53351.D	1	10/28/17	AJ	n/a	n/a	VP2027
FA48784-18MSD	P53352.D	1	10/28/17	AJ	n/a	n/a	VP2027
FA48784-18 <sup>a</sup>	P53350.D	1	10/28/17	AJ	n/a	n/a	VP2027

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA48716-1, FA48716-2

CAS No.	Compound	FA48784-18		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-69-4	Trichlorofluoromethane	2.0	U	25	27.4	110	25	27.8	111	1	71-156/21
75-01-4	Vinyl Chloride	9.7		25	32.7	92	25	34.6	100	6	69-159/18
	m,p-Xylene	2.0	U	50	59.5	119	50	60.0	120	1	79-126/15
95-47-6	o-Xylene	1.0	U	25	27.6	110	25	27.8	111	1	80-127/14

**CAS No.** Surrogate Recoveries      **MS**      **MSD**      **FA48784-18 Limits**

1868-53-7	Dibromofluoromethane	101%	102%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	105%	105%	101%	79-125%
2037-26-5	Toluene-D8	97%	98%	100%	85-112%
460-00-4	4-Bromofluorobenzene	97%	99%	101%	83-118%

(a) Sample was not preserved to a pH < 2.

\* = Outside of Control Limits.

6.3.2  
6

**General Chemistry****QC Data Summaries**

7

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA48716  
Account: UNIVAR - Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Cyanide, Total	GP30518/GN76699	0.010	0.0	mg/l	0.1	0.104	104.0	90-110%
HEM Oil and Grease	GP30544/GN76753	5.0	0.0	mg/l	40.0	56.3	140.7*(a)	78-114%

Associated Samples:

Batch GP30518: FA48716-2

Batch GP30544: FA48716-2

(\*) Outside of QC limits

(a) Spike recovery outside of acceptable QC criteria.

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA48716  
Account: UNIVAR - Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Cyanide, Total	GP30518/GN76699	LA38109-2	mg/l	0.043	0.1	0.11	67.0N(a)	90-110%
HEM Oil and Grease	GP30544/GN76753	FA48792-1	mg/l	0.0	40.0	49.2	127.7*(a)	78-114%

Associated Samples:

Batch GP30518: FA48716-2

Batch GP30544: FA48716-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery outside of acceptable QC criteria.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA48716  
Account: UNIVAR - Univar  
Project: ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Cyanide, Total	GP30518/GN76699	LA38109-2	mg/l	0.043	0.1	0.14	24.0*(a)	20%

Associated Samples:

Batch GP30518: FA48716-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) High RPD due to matrix interference.

7.3  
7

# Memorandum

Environmental  
Resources  
Management

**To:** Tanya Battye

**From:** Rachel James

**Date:** 7 November 2017

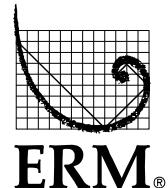
**Subject:** Data Review of Univar NW Yeon Water Treatment System Samples Collected 24 October 2017

**Project Number:** 0380575

**Data Packages:** SGS Accutest Data Package FA48716

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1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
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The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017 and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017.

## **HOLDING TIME AND PRESERVATION EVALUATION**

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C. The laboratory noted that samples W-1-20171024, W-2-20171024, and TRIP BLANK were not preserved to a pH of less than 2. All three samples were analyzed within the shortened holding time of 7 days for unpreserved samples and qualifications were not necessary. Data associated with exceeded preservation requirements are listed in Table 1. Remaining samples were acceptably preserved and were prepared and analyzed within the method-prescribed time period from the date of collection.

## **BLANK EVALUATION**

The method and trip blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory or during shipment, handling, and storage.

### ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance, with the exception noted on Table 2. An LCS sample for HEM Oil and Grease was recovered above the control limit; however, the associated sample was nondetected and qualifications were not necessary.

### ***MATRIX SPIKE EVALUATION***

The matrix spike (MS)/matrix spike duplicate (MSD) recoveries and RPDs were within laboratory limits of acceptance with several exceptions. No data were qualified as all outliers are from non-project samples. The outliers can be found in Table 2.

### ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

### ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

### ***OVERALL ASSESSMENT***

No results were qualified or rejected. All of the data can be used for decision-making purposes. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

**Table 1**  
*Samples with Exceeded Preservation Requirements*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in October 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Analysis Method	Preservation Condition	Limits	ERM Qualifier
FA48716	W-1-20171024	8260B	pH > 2	pH < 2	--
	W-2-20171024				
	TRIP BLANK				

Lab report reviewed: FA48716

**Table 2**  
*Spike Recoveries Outside of Acceptable Limits*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in October 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
<b>LCS/LCSD</b>										
FA48716	LCS GN76753	--	HEM Oil and Grease	140.7	78-114	NC	--	--	--	--
<b>MS/MSD</b>										
FA48716	Batch QC	--	2-Chloroethyl Vinyl Ether	0/0	56-122	NC	23	--	--	--
		--	Styrene	62/65	78-119	5	23	--	--	--
	Batch QC	--	HEM Oil and Grease	127.7	78-114	NC	--	--	--	--
	Batch QC	--	Cyanide, Total	67/97	90-110	24	20	--	--	--

Lab report reviewed: FA48716

**Key:**

Batch = Spike sample was prepared using non-client sample

HEM = Hexane extractable material

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

NC = Not calculated

RPD = Relative percent difference



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## LABORATORY REPORT

November 8, 2017

Brendan Robinson  
ERM West, Incorporated  
1001 SW 5th Ave, Suite 1010  
Portland, OR 97204

**RE: PORTLAND, OR (NW YEON)**

Dear Brendan:

Enclosed are the results of the sample submitted to our laboratory on October 26, 2017. For your reference, this analysis has been assigned our service request number P1705310.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

*Kate Kaneko*  
By Kate Kaneko at 4:14 pm, 11/08/17

Kate Kaneko  
Project Manager



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Client: ERM West, Incorporated  
Project: PORTLAND, OR (NW YEON)

Service Request No: P1705310

## CASE NARRATIVE

The sample was received intact under chain of custody on October 26, 2017 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

### Volatile Organic Compound Analysis

The sample was analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	<a href="http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home">http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home</a>	AZ0694
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Louisiana DEQ (NELAP)	<a href="http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx">http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx</a>	05071
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2016036
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	1177034
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-004
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
PJLA (DoD ELAP)	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	65818 (Testing)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-17-8
Utah DOH (NELAP)	<a href="http://health.utah.gov/lab/environmental-lab-certification/">http://health.utah.gov/lab/environmental-lab-certification/</a>	CA01627201 7-8
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946
Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <a href="http://www.alsglobal.com">www.alsglobal.com</a> , or at the accreditation body's website.		
Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.		

**ALS ENVIRONMENTAL****DETAIL SUMMARY REPORT**

Client: ERM West, Incorporated  
Project ID: PORTLAND, OR (NW YEON) Service Request: P1705310

Date Received: 10/26/2017  
Time Received: 09:30

[Redacted]  
TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
VSP-2-20171024	P1705310-001	Air	10/24/2017	06:30	SC02234	-1.37	3.72	X



**ALS Environmental  
Sample Acceptance Check Form**

Client: ERM West, Incorporated

Work order: P1705310

Project: **PORTLAND, OR (NW YEON)**

Sample(s) received on: 10/26/17

---

Date opened: 10/26/17

by: ADAVID

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		<b>Yes</b>	<b>No</b>	<b>N/A</b>
1	Were <b>sample containers</b> properly marked with client sample ID?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Did <b>sample containers</b> arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Were <b>chain-of-custody</b> papers used and filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Did <b>sample container labels</b> and/or tags agree with custody papers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Was <b>sample volume</b> received adequate for analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Are samples within specified holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Were <b>custody seals</b> on outside of cooler/Box/Container?  Location of seal(s)? _____ Sealing Lid?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Were signature and date included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?  Is there a client indication that the submitted samples are <b>pH</b> preserved?  Were <b>VOA vials</b> checked for presence/absence of air bubbles?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<b>Tubes:</b> Are the tubes capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	<b>Badges:</b> Are the badges properly capped and intact?  Are dual bed badges separated and individually capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Explain any discrepancies: (include lab sample ID numbers):

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171024  
**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310  
 ALS Sample ID: P1705310-001

Test Code: EPA TO-15 Date Collected: 10/24/17  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 10/26/17  
 Analyst: Simon Cao Date Analyzed: 11/3/17  
 Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.0050 Liter(s)  
 Test Notes:  
 Container ID: SC02234

Initial Pressure (psig): -1.37      Final Pressure (psig): 3.72

Container Dilution Factor: 1.38

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	140	ND	67	
75-01-4	Vinyl Chloride	<b>140</b>	140	<b>56</b>	54	
74-83-9	Bromomethane	ND	140	ND	36	
75-00-3	Chloroethane	ND	140	ND	52	
67-64-1	Acetone	ND	1,400	ND	580	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	140	ND	25	
75-35-4	1,1-Dichloroethene	<b>410</b>	140	<b>100</b>	35	
75-09-2	Methylene Chloride	ND	140	ND	40	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	140	ND	18	
75-15-0	Carbon Disulfide	ND	1,400	ND	440	
156-60-5	trans-1,2-Dichloroethene	<b>240</b>	140	<b>61</b>	35	
75-34-3	1,1-Dichloroethane	<b>1,100</b>	140	<b>280</b>	34	
1634-04-4	Methyl tert-Butyl Ether	ND	140	ND	38	
108-05-4	Vinyl Acetate	ND	1,400	ND	390	
78-93-3	2-Butanone (MEK)	ND	1,400	ND	470	
156-59-2	cis-1,2-Dichloroethene	<b>24,000</b>	140	<b>6,100</b>	35	
67-66-3	Chloroform	ND	140	ND	28	
107-06-2	1,2-Dichloroethane	ND	140	ND	34	
71-55-6	1,1,1-Trichloroethane	<b>19,000</b>	140	<b>3,500</b>	25	
71-43-2	Benzene	ND	140	ND	43	
56-23-5	Carbon Tetrachloride	ND	140	ND	22	
78-87-5	1,2-Dichloropropane	ND	140	ND	30	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171024  
**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310  
 ALS Sample ID: P1705310-001

Test Code: EPA TO-15 Date Collected: 10/24/17  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 10/26/17  
 Analyst: Simon Cao Date Analyzed: 11/3/17  
 Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.0050 Liter(s)  
 Test Notes:  
 Container ID: SC02234

Initial Pressure (psig): -1.37      Final Pressure (psig): 3.72

Container Dilution Factor: 1.38

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	140	ND	21	
79-01-6	Trichloroethene	9,000	140	1,700	26	
10061-01-5	cis-1,3-Dichloropropene	ND	140	ND	30	
108-10-1	4-Methyl-2-pentanone	ND	140	ND	34	
10061-02-6	trans-1,3-Dichloropropene	ND	140	ND	30	
79-00-5	1,1,2-Trichloroethane	ND	140	ND	25	
108-88-3	Toluene	4,700	140	1,200	37	
591-78-6	2-Hexanone	ND	140	ND	34	
124-48-1	Dibromochloromethane	ND	140	ND	16	
106-93-4	1,2-Dibromoethane	ND	140	ND	18	
127-18-4	Tetrachloroethene	24,000	140	3,500	20	
108-90-7	Chlorobenzene	ND	140	ND	30	
100-41-4	Ethylbenzene	ND	140	ND	32	
179601-23-1	m,p-Xylenes	ND	280	ND	64	
75-25-2	Bromoform	ND	140	ND	13	
100-42-5	Styrene	ND	140	ND	32	
95-47-6	o-Xylene	ND	140	ND	32	
79-34-5	1,1,2,2-Tetrachloroethane	ND	140	ND	20	
541-73-1	1,3-Dichlorobenzene	ND	140	ND	23	
106-46-7	1,4-Dichlorobenzene	ND	140	ND	23	
95-50-1	1,2-Dichlorobenzene	ND	140	ND	23	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310

ALS Sample ID: P171103-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/3/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.50	ND	0.24	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	ND	0.089	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
67-66-3	Chloroform	ND	0.50	ND	0.10	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310

ALS Sample ID: P171103-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/3/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** ERM West, Incorporated  
**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8  
Analyst: Simon Cao  
Sample Type: 6.0 L Summa Canister(s)  
Test Notes:

Date(s) Collected: 10/24/17

Date(s) Received: 10/26/17

Date(s) Analyzed: 11/3/17

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P171103-MB	111	103	85	70-130	
Lab Control Sample	P171103-LCS	106	102	87	70-130	
VSP-2-20171024	P1705310-001	107	100	85	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310

ALS Sample ID: P171103-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/3/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount	Result µg/m³	% Recovery	ALS	
		µg/m³			Acceptance Limits	Data Qualifier
74-87-3	Chloromethane	210	231	110	51-130	
75-01-4	Vinyl Chloride	211	245	116	61-125	
74-83-9	Bromomethane	210	200	95	73-123	
75-00-3	Chloroethane	210	220	105	69-122	
67-64-1	Acetone	1,050	1050	100	57-117	
75-69-4	Trichlorofluoromethane (CFC 11)	208	190	91	63-98	
75-35-4	1,1-Dichloroethene	213	200	94	76-118	
75-09-2	Methylene Chloride	213	196	92	60-118	
76-13-1	Trichlorotrifluoroethane (CFC 113)	214	183	86	73-114	
75-15-0	Carbon Disulfide	214	199	93	57-102	
156-60-5	trans-1,2-Dichloroethene	214	225	105	74-123	
75-34-3	1,1-Dichloroethane	212	205	97	69-111	
1634-04-4	Methyl tert-Butyl Ether	213	202	95	69-113	
108-05-4	Vinyl Acetate	1,060	1130	107	76-128	
78-93-3	2-Butanone (MEK)	212	212	100	63-127	
156-59-2	cis-1,2-Dichloroethene	212	209	99	72-117	
67-66-3	Chloroform	212	195	92	70-109	
107-06-2	1,2-Dichloroethane	212	194	92	69-113	
71-55-6	1,1,1-Trichloroethane	212	195	92	72-115	
71-43-2	Benzene	213	189	89	65-107	
56-23-5	Carbon Tetrachloride	214	201	94	71-113	
78-87-5	1,2-Dichloropropane	212	212	100	71-115	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** PORTLAND, OR (NW YEON)

ALS Project ID: P1705310

ALS Sample ID: P171103-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Simon Cao

Date Analyzed: 11/3/17

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS	
					Acceptance Limits	Data Qualifier
75-27-4	Bromodichloromethane	214	216	101	75-118	
79-01-6	Trichloroethene	212	185	87	68-114	
10061-01-5	cis-1,3-Dichloropropene	208	212	102	77-126	
108-10-1	4-Methyl-2-pentanone	213	224	105	69-126	
10061-02-6	trans-1,3-Dichloropropene	213	233	109	79-125	
79-00-5	1,1,2-Trichloroethane	212	205	97	75-119	
108-88-3	Toluene	211	185	88	59-118	
591-78-6	2-Hexanone	211	230	109	69-129	
124-48-1	Dibromochloromethane	212	207	98	74-136	
106-93-4	1,2-Dibromoethane	211	208	99	73-131	
127-18-4	Tetrachloroethene	212	182	86	65-130	
108-90-7	Chlorobenzene	212	189	89	68-120	
100-41-4	Ethylbenzene	212	190	90	68-122	
179601-23-1	m,p-Xylenes	424	376	89	68-123	
75-25-2	Bromoform	212	211	100	69-130	
100-42-5	Styrene	211	203	96	71-133	
95-47-6	o-Xylene	211	190	90	68-122	
79-34-5	1,1,2,2-Tetrachloroethane	212	213	100	69-130	
541-73-1	1,3-Dichlorobenzene	212	198	93	65-136	
106-46-7	1,4-Dichlorobenzene	214	199	93	66-141	
95-50-1	1,2-Dichlorobenzene	214	204	95	67-136	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# Memorandum

Environmental  
Resources  
Management

To: Tanya Battye

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)

From: Jack James

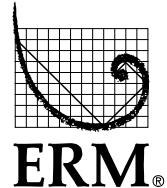
Date: 14 November 2017

Subject: Data Review of Univar NW Yeon Soil Vapor  
Extraction Samples Collected 24 October 2017

Project Number: 0380575.05

Data Package: ALS Data Package P1705310

---



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017.

## ***HOLDING TIME AND PRESERVATION EVALUATION***

The samples were prepared and analyzed within the method-prescribed time period from the date of collection. The sample shipments were received at the laboratory within the method-prescribed temperature and preservation requirements. None of the data were qualified based on holding time or preservation exceedances.

## ***BLANK EVALUATION***

The method blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory.

## ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

### ***MATRIX SPIKE EVALUATION***

Matrix spikes are not performed for air samples.

### ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

### ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

### ***OVERALL ASSESSMENT***

No results were qualified or rejected. All of the data can be used for decision-making purposes. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.



ACCUTEST

Southeast

11/30/17

SGS ACCUTEST IS PART OF SGS, THE WORLD'S LEADING INSPECTION,  
VERIFICATION, TESTING AND CERTIFICATION COMPANY.



e-Hardcopy 2.0  
Automated Report

## Technical Report for

Univar

ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

S074

SGS Accutest Job Number: FA49466

Sampling Date: 11/16/17



Report to:

ERM  
1001 SW 5th Ave Suite 1010  
Portland, OR 97204  
Brendan.Robinson@erm.com; Dylan.Stankus@erm.com;  
tanya.battye@erm.com  
ATTN: Brendan Robinson

Total number of pages in report: 34



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Elvin Kumar 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(L-A-B L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, GA, IA, KY, MA, NV, OK, OR, UT, WA

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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Summary of Hits .....</b>	<b>5</b>
<b>Section 4: Sample Results .....</b>	<b>7</b>
<b>4.1: FA49466-1: TRIP-1 .....</b>	<b>8</b>
<b>4.2: FA49466-2: DMW-07-20171116 .....</b>	<b>10</b>
<b>4.3: FA49466-3: FB-1-20171116 .....</b>	<b>12</b>
<b>4.4: FA49466-4: DMW-08-20171116 .....</b>	<b>14</b>
<b>4.5: FA49466-5: SMW-40-20171116 .....</b>	<b>17</b>
<b>4.6: FA49466-6: SMW-40-20171116-D1 .....</b>	<b>19</b>
<b>Section 5: Misc. Forms .....</b>	<b>21</b>
<b>5.1: Chain of Custody .....</b>	<b>22</b>
<b>Section 6: MS Volatiles - QC Data Summaries .....</b>	<b>25</b>
<b>6.1: Method Blank Summary .....</b>	<b>26</b>
<b>6.2: Blank Spike Summary .....</b>	<b>29</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>32</b>



## Sample Summary

Univar

**Job No:** FA49466ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA49466-1	11/16/17	00:00 SR	11/17/17	AQ Trip Blank Water	TRIP-1
FA49466-2	11/16/17	09:31 SR	11/17/17	AQ Ground Water	DMW-07-20171116
FA49466-3	11/16/17	09:41 SR	11/17/17	AQ Field Blank Water	FB-1-20171116
FA49466-4	11/16/17	10:01 SR	11/17/17	AQ Ground Water	DMW-08-20171116
FA49466-5	11/16/17	10:27 SR	11/17/17	AQ Ground Water	SMW-40-20171116
FA49466-6	11/16/17	10:27 SR	11/17/17	AQ Ground Water	SMW-40-20171116-D1

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Univar

**Job** FA49466

**Site:** ERMOP:Groundwater Sampling-3950 NW Yeon Avenue,

**Report** 11/30/2017 11:01:53

4 Samples, 1 Trip Blank and 1 Field Blank were collected on 11/16/2017 and were received at SGS Accutest Southeast (SASE) on 11/17/2017 properly preserved, at 4.4 Deg. C and intact. These Samples received an SASE job number of FA49466. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** V5E200

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA49480-2MS, FA49480-2MSD were used as the QC samples indicated.

**Matrix:** AQ

**Batch ID:** V5E203

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA49479-3MS, FA49479-3MSD were used as the QC samples indicated.

SGS Accutest (SASE) certifies that this report meets the project requirements for analytical data produced for the samples as received at SASE and as stated on the COC. SASE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SASE Quality Manual except as noted above. This report is to be used in its entirety. SASE is not responsible for any assumptions of data quality if partial data packages are used

Narrative prepared by:

Lovelie Metzgar, QA Officer (signature on file)

Date: November 30, 2017

## Summary of Hits

Page 1 of 2

Job Number: FA49466

Account: Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 11/16/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
--------------------------	------------------	-----------------	----	-----	-------	--------

### FA49466-1 TRIP-1

No hits reported in this sample.

### FA49466-2 DMW-07-20171116

1,1-Dichloroethane	17.2	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	73.8	1.0	ug/l	SW846 8260B
Tetrachloroethylene	4.3	1.0	ug/l	SW846 8260B
Trichloroethylene	18.1	1.0	ug/l	SW846 8260B
Vinyl Chloride	27.4	1.0	ug/l	SW846 8260B

### FA49466-3 FB-1-20171116

Styrene	6.5	1.0	ug/l	SW846 8260B
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### FA49466-4 DMW-08-20171116

1,1-Dichloroethane	16.9	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	1.7	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	109	2.0	ug/l	SW846 8260B
Tetrachloroethylene	3.8	1.0	ug/l	SW846 8260B
Toluene	2.4	1.0	ug/l	SW846 8260B
Trichloroethylene	13.1	1.0	ug/l	SW846 8260B
Vinyl Chloride	75.1	1.0	ug/l	SW846 8260B

### FA49466-5 SMW-40-20171116

Benzene	2.8	1.0	ug/l	SW846 8260B
1,2-Dichlorobenzene	4.8	1.0	ug/l	SW846 8260B
1,1-Dichloroethane	15.9	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	1.7	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	49.5	1.0	ug/l	SW846 8260B
Ethylbenzene	1.8	1.0	ug/l	SW846 8260B
Tetrachloroethylene	16.0	1.0	ug/l	SW846 8260B
Toluene	3.8	1.0	ug/l	SW846 8260B
Trichloroethylene	40.3	1.0	ug/l	SW846 8260B
Vinyl Chloride	25.3	1.0	ug/l	SW846 8260B

### FA49466-6 SMW-40-20171116-D1

Benzene	2.8	1.0	ug/l	SW846 8260B
1,2-Dichlorobenzene	4.7	1.0	ug/l	SW846 8260B
1,1-Dichloroethane	15.7	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	1.7	1.0	ug/l	SW846 8260B

## Summary of Hits

Page 2 of 2

Job Number: FA49466

Account: Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 11/16/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
cis-1,2-Dichloroethylene		48.6	1.0		ug/l	SW846 8260B
Ethylbenzene		1.8	1.0		ug/l	SW846 8260B
Tetrachloroethylene		16.2	1.0		ug/l	SW846 8260B
Toluene		3.9	1.0		ug/l	SW846 8260B
Trichloroethylene		40.6	1.0		ug/l	SW846 8260B
Vinyl Chloride		24.2	1.0		ug/l	SW846 8260B



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**Section 4**

4

**Sample Results**

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**Report of Analysis**

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**Report of Analysis**

Page 1 of 2

<b>Client Sample ID:</b>	TRIP-1	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-1	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4802.D	1	11/22/17 12:02	MM	n/a	n/a	V5E200
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.1

4

**Report of Analysis**

<b>Client Sample ID:</b>	TRIP-1	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-1	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	101%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.2  
4

<b>Client Sample ID:</b>	DMW-07-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-2	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4803.D	1	11/22/17 12:26	MM	n/a	n/a	V5E200
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	17.2	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	73.8	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.2  
4

<b>Client Sample ID:</b>	DMW-07-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-2	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	4.3	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	18.1	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	27.4	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	103%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	98%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.3  
4

<b>Client Sample ID:</b>	FB-1-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-3	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4804.D	1	11/22/17 12:51	MM	n/a	n/a	V5E200
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	FB-1-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-3	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	6.5	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	103%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	100%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

**Client Sample ID:** DMW-08-20171116**Lab Sample ID:** FA49466-4**Date Sampled:** 11/16/17**Matrix:** AQ - Ground Water**Date Received:** 11/17/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4805.D	1	11/22/17 13:15	MM	n/a	n/a	V5E200
Run #2	5E4881.D	2	11/27/17 09:44	MM	n/a	n/a	V5E203

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	16.9	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.7	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	109 <sup>a</sup>	2.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	DMW-08-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-4	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	3.8	1.0	ug/l	
108-88-3	Toluene	2.4	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	13.1	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	75.1	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	106%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	104%	79-125%
2037-26-5	Toluene-D8	97%	97%	85-112%
460-00-4	4-Bromofluorobenzene	99%	97%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	DMW-08-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-4	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

45  
4**Client Sample ID:** SMW-40-20171116**Lab Sample ID:** FA49466-5**Date Sampled:** 11/16/17**Matrix:** AQ - Ground Water**Date Received:** 11/17/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4806.D	1	11/22/17 13:40	MM	n/a	n/a	V5E200
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	2.8	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	4.8	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	15.9	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.7	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	49.5	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-40-20171116	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-5	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	1.8	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	16.0	1.0	ug/l	
108-88-3	Toluene	3.8	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	40.3	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	25.3	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	103%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.6  
4**Client Sample ID:** SMW-40-20171116-D1**Lab Sample ID:** FA49466-6**Date Sampled:** 11/16/17**Matrix:** AQ - Ground Water**Date Received:** 11/17/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	5E4807.D	1	11/22/17 14:05	MM	n/a	n/a	V5E200
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	2.8	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	4.7	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	15.7	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.7	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	48.6	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-40-20171116-D1	<b>Date Sampled:</b>	11/16/17
<b>Lab Sample ID:</b>	FA49466-6	<b>Date Received:</b>	11/17/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	1.8	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	16.2	1.0	ug/l	
108-88-3	Toluene	3.9	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	40.6	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	24.2	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	104%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Misc. Forms**

5

**Custody Documents and Other Forms**

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Includes the following where applicable:

- Chain of Custody



# SGS Accutest Sample Receipt Summary

Job Number: FA49466	Client: ERM	Project: YEON SITE
Date / Time Received: 11/17/2017 9:15:00 AM	Delivery Method: FedEx	Airbill #'s: 812188499264
Therm ID: IR 1;		Therm CF: 0.4;
Cooler Temps (Raw Measured) °C: Cooler 1: (4.0);		# of Coolers: 1
Cooler Temps (Corrected) °C: Cooler 1: (4.4);		

<b>Cooler Information</b>		<b>Y or N</b>	<b>Sample Information</b>	<b>Y or N</b>	<b>N/A</b>	
1. Custody Seals Present		<input checked="" type="checkbox"/> <input type="checkbox"/>	1. Sample labels present on bottles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Custody Seals Intact		<input checked="" type="checkbox"/> <input type="checkbox"/>	2. Samples preserved properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Temp criteria achieved		<input checked="" type="checkbox"/> <input type="checkbox"/>	3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Cooler temp verification		IR Gun	4. Condition of sample	Intact		
5. Cooler media		Ice (Bag)	5. Sample recvd within HT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Trip Blank Information</b>		<b>Y or N</b>	<b>N/A</b>	6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>	
1. Trip Blank present / cooler		<input checked="" type="checkbox"/> <input type="checkbox"/>	7. VOCs have headspace	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Trip Blank listed on COC		<input checked="" type="checkbox"/> <input type="checkbox"/>	8. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
		<b>W or S</b>	<b>N/A</b>	9. Compositing instructions clear	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Type Of TB Received		<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				11. % Solids Jar received?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				12. Residual Chlorine Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Misc. Information</b>					
Number of Encores: 25-Gram	<input type="text"/>	5-Gram	<input type="text"/>	Number of 5035 Field Kits:	<input type="text"/>
Test Strip Lot #:	pH 0-3	230315		pH 10-12	219813A
Residual Chlorine Test Strip Lot #:			Number of Lab Filtered Metals: _____ Other: (Specify) _____		
Comments					

SM001  
Rev. Date 05/24/17

Technician: SHAYLAP

Date: 11/17/2017 9:15:00 A

Reviewer: BR

Date: 11/20/2017

**FA49466: Chain of Custody**

Page 2 of 3

**Job Change Order:** FA49466

<b>Requested Date:</b>	11/21/2017	<b>Received Date:</b>	11/17/2017
<b>Account Name:</b>	Univar	<b>Due Date:</b>	11/28/2017
<b>Project Description:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon A	<b>Deliverable:</b>	COMMNB
<b>CSR:</b>	elvink	<b>TAT (Days):</b>	3

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**Sample #:** FA49466-ALL      **Change:**  
**Dept:** Client revised the TAT to 3 Day Rush, Due 11/28/17: V8260SL  
**TAT:** 3

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**FA49466: Chain of Custody****Above Changes Per:** Dylan Stankus**Date/Time:** 11/21/2017 12:24:16 PM**Page 3 of 3**

To Client: This Change Order is confirmation of the revisions, previously discussed with the SGS Accutest Client Service Representative.

Page 1 of 1

**MS Volatiles****QC Data Summaries**

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 2

Job Number: FA49466  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E200-MB	5E4797.D	1	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

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## Method Blank Summary

Page 2 of 2

Job Number: FA49466

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E200-MB	5E4797.D	1	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	100% 83-118%
17060-07-0	1,2-Dichloroethane-D4	98% 79-125%
2037-26-5	Toluene-D8	99% 85-112%
460-00-4	4-Bromofluorobenzene	98% 83-118%

## Method Blank Summary

Page 1 of 1

Job Number: FA49466  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E203-MB	5E4880.D	1	11/27/17	MM	n/a	n/a	V5E203

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-4

CAS No.	Compound	Result	RL	Units	Q
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	104%
17060-07-0	1,2-Dichloroethane-D4	103%
2037-26-5	Toluene-D8	97%
460-00-4	4-Bromofluorobenzene	96%

## Blank Spike Summary

Page 1 of 2

Job Number: FA49466  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E200-BS	5E4796.D	1	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	87.7	70	50-147
71-43-2	Benzene	25	25.5	102	81-122
108-86-1	Bromobenzene	25	26.3	105	80-121
74-97-5	Bromochloromethane	25	26.7	107	76-123
75-27-4	Bromodichloromethane	25	24.8	99	79-123
75-25-2	Bromoform	25	26.5	106	66-123
78-93-3	2-Butanone (MEK)	125	115	92	56-143
104-51-8	n-Butylbenzene	25	24.5	98	79-126
135-98-8	sec-Butylbenzene	25	25.0	100	83-133
98-06-6	tert-Butylbenzene	25	23.9	96	80-133
75-15-0	Carbon Disulfide	25	26.3	105	66-148
56-23-5	Carbon Tetrachloride	25	26.9	108	76-136
108-90-7	Chlorobenzene	25	25.4	102	82-124
75-00-3	Chloroethane	25	30.0	120	62-144
67-66-3	Chloroform	25	25.9	104	80-124
95-49-8	o-Chlorotoluene	25	24.1	96	81-127
106-43-4	p-Chlorotoluene	25	24.4	98	83-130
124-48-1	Dibromochloromethane	25	26.0	104	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	22.7	91	64-123
106-93-4	1,2-Dibromoethane	25	26.0	104	75-120
75-71-8	Dichlorodifluoromethane	25	27.7	111	42-167
95-50-1	1,2-Dichlorobenzene	25	25.9	104	82-124
541-73-1	1,3-Dichlorobenzene	25	26.7	107	84-125
106-46-7	1,4-Dichlorobenzene	25	25.5	102	78-120
75-34-3	1,1-Dichloroethane	25	26.8	107	81-122
107-06-2	1,2-Dichloroethane	25	24.6	98	75-125
75-35-4	1,1-Dichloroethylene	25	24.3	97	78-137
156-59-2	cis-1,2-Dichloroethylene	25	26.9	108	78-120
156-60-5	trans-1,2-Dichloroethylene	25	26.6	106	76-127
78-87-5	1,2-Dichloropropane	25	25.3	101	76-124
142-28-9	1,3-Dichloropropane	25	23.8	95	80-118
594-20-7	2,2-Dichloropropane	25	26.5	106	74-139
563-58-6	1,1-Dichloropropene	25	24.2	97	79-131
10061-01-5	cis-1,3-Dichloropropene	25	23.2	93	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.2	97	80-120
100-41-4	Ethylbenzene	25	25.5	102	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA49466

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E200-BS	5E4796.D	1	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	28.9	116	75-142
591-78-6	2-Hexanone	125	101	81	61-129
98-82-8	Isopropylbenzene	25	25.8	103	83-132
99-87-6	p-Isopropyltoluene	25	25.4	102	79-130
74-83-9	Methyl Bromide	25	25.3	101	59-143
74-87-3	Methyl Chloride	25	23.1	92	50-159
74-95-3	Methylene Bromide	25	25.6	102	78-119
75-09-2	Methylene Chloride	25	22.3	89	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	102	82	66-122
91-20-3	Naphthalene	25	24.8	99	63-132
103-65-1	n-Propylbenzene	25	24.1	96	82-133
100-42-5	Styrene	25	24.1	96	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	25.9	104	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	24.3	97	72-120
127-18-4	Tetrachloroethylene	25	29.6	118	76-135
108-88-3	Toluene	25	25.7	103	80-120
87-61-6	1,2,3-Trichlorobenzene	25	25.5	102	68-131
120-82-1	1,2,4-Trichlorobenzene	25	25.4	102	73-129
71-55-6	1,1,1-Trichloroethane	25	24.3	97	75-130
79-00-5	1,1,2-Trichloroethane	25	24.7	99	76-119
79-01-6	Trichloroethylene	25	27.0	108	81-126
75-69-4	Trichlorofluoromethane	25	28.9	116	71-156
96-18-4	1,2,3-Trichloropropane	25	24.3	97	77-120
95-63-6	1,2,4-Trimethylbenzene	25	23.8	95	79-120
108-67-8	1,3,5-Trimethylbenzene	25	24.7	99	79-120
75-01-4	Vinyl Chloride	25	25.0	100	69-159
	m,p-Xylene	50	48.5	97	79-126
95-47-6	o-Xylene	25	23.7	95	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	98%	79-125%
2037-26-5	Toluene-D8	98%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

\* = Outside of Control Limits.

6.2.1  
6

## Blank Spike Summary

Page 1 of 1

Job Number: FA49466  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5E203-BS	5E4879.D	1	11/27/17	MM	n/a	n/a	V5E203

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
156-59-2	cis-1,2-Dichloroethylene	25	26.9	108	78-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	106%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%
2037-26-5	Toluene-D8	96%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

\* = Outside of Control Limits.

6.2.2  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** FA49466  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA49480-2MS	5E4818.D	10	11/22/17	MM	n/a	n/a	V5E200
FA49480-2MSD	5E4819.D	10	11/22/17	MM	n/a	n/a	V5E200
FA49480-2	5E4809.D	10	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	FA49480-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	ND		1250	1000	80	1250	1000	80	0	50-147/21
71-43-2	Benzene	ND		250	255	102	250	255	102	0	81-122/14
108-86-1	Bromobenzene	ND		250	255	102	250	257	103	1	80-121/14
74-97-5	Bromochloromethane	ND		250	270	108	250	269	108	0	76-123/14
75-27-4	Bromodichloromethane	ND		250	245	98	250	246	98	0	79-123/19
75-25-2	Bromoform	ND		250	211	84	250	218	87	3	66-123/21
78-93-3	2-Butanone (MEK)	ND		1250	1220	98	1250	1250	100	2	56-143/18
104-51-8	n-Butylbenzene	ND		250	233	93	250	231	92	1	79-126/16
135-98-8	sec-Butylbenzene	ND		250	240	96	250	239	96	0	83-133/16
98-06-6	tert-Butylbenzene	ND		250	233	93	250	233	93	0	80-133/16
75-15-0	Carbon Disulfide	ND		250	232	93	250	240	96	3	66-148/23
56-23-5	Carbon Tetrachloride	ND		250	270	108	250	268	107	1	76-136/23
108-90-7	Chlorobenzene	ND		250	255	102	250	254	102	0	82-124/14
75-00-3	Chloroethane	ND		250	306	122	250	305	122	0	62-144/20
67-66-3	Chloroform	ND		250	271	108	250	268	107	1	80-124/15
95-49-8	o-Chlorotoluene	ND		250	234	94	250	235	94	0	81-127/15
106-43-4	p-Chlorotoluene	ND		250	236	94	250	238	95	1	83-130/15
124-48-1	Dibromochloromethane	ND		250	227	91	250	235	94	3	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		250	227	91	250	225	90	1	64-123/18
106-93-4	1,2-Dibromoethane	ND		250	250	100	250	254	102	2	75-120/13
75-71-8	Dichlorodifluoromethane	ND		250	292	117	250	299	120	2	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		250	249	100	250	251	100	1	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		250	259	104	250	259	104	0	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		250	250	100	250	249	100	0	78-120/15
75-34-3	1,1-Dichloroethane	32.5		250	309	111	250	306	109	1	81-122/15
107-06-2	1,2-Dichloroethane	ND		250	264	106	250	263	105	0	75-125/14
75-35-4	1,1-Dichloroethylene	10.5		250	259	99	250	257	99	1	78-137/18
156-59-2	cis-1,2-Dichloroethylene	162		250	436	110	250	431	108	1	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		250	275	110	250	272	109	1	76-127/17
78-87-5	1,2-Dichloropropane	ND		250	248	99	250	250	100	1	76-124/14
142-28-9	1,3-Dichloropropane	ND		250	231	92	250	234	94	1	80-118/13
594-20-7	2,2-Dichloropropane	ND		250	236	94	250	234	94	1	74-139/17
563-58-6	1,1-Dichloropropene	ND		250	243	97	250	243	97	0	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		250	206	82	250	210	84	2	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		250	229	92	250	234	94	2	80-120/22
100-41-4	Ethylbenzene	ND		250	254	102	250	255	102	0	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA49466  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA49480-2MS	5E4818.D	10	11/22/17	MM	n/a	n/a	V5E200
FA49480-2MSD	5E4819.D	10	11/22/17	MM	n/a	n/a	V5E200
FA49480-2	5E4809.D	10	11/22/17	MM	n/a	n/a	V5E200

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA49466-1, FA49466-2, FA49466-3, FA49466-4, FA49466-5, FA49466-6

CAS No.	Compound	FA49480-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	ND	250	272	109	250	268	107	1	75-142/19	
591-78-6	2-Hexanone	ND	1250	1080	86	1250	1100	88	2	61-129/18	
98-82-8	Isopropylbenzene	ND	250	248	99	250	250	100	1	83-132/15	
99-87-6	p-Isopropyltoluene	ND	250	243	97	250	242	97	0	79-130/16	
74-83-9	Methyl Bromide	ND	250	254	102	250	257	103	1	59-143/19	
74-87-3	Methyl Chloride	ND	250	246	98	250	248	99	1	50-159/19	
74-95-3	Methylene Bromide	ND	250	261	104	250	261	104	0	78-119/14	
75-09-2	Methylene Chloride	ND	250	242	97	250	238	95	2	69-135/16	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1250	1080	86	1250	1100	88	2	66-122/16	
91-20-3	Naphthalene	ND	250	230	92	250	236	94	3	63-132/25	
103-65-1	n-Propylbenzene	ND	250	233	93	250	233	93	0	82-133/15	
100-42-5	Styrene	ND	250	231	92	250	231	92	0	78-119/23	
630-20-6	1,1,1,2-Tetrachloroethane	ND	250	252	101	250	256	102	2	77-122/19	
79-34-5	1,1,2,2-Tetrachloroethane	ND	250	241	96	250	239	96	1	72-120/14	
127-18-4	Tetrachloroethylene	ND	250	265	106	250	274	110	3	76-135/16	
108-88-3	Toluene	ND	250	250	100	250	253	101	1	80-120/14	
87-61-6	1,2,3-Trichlorobenzene	ND	250	242	97	250	245	98	1	68-131/25	
120-82-1	1,2,4-Trichlorobenzene	ND	250	239	96	250	242	97	1	73-129/20	
71-55-6	1,1,1-Trichloroethane	36.0	250	288	101	250	283	99	2	75-130/16	
79-00-5	1,1,2-Trichloroethane	ND	250	247	99	250	251	100	2	76-119/14	
79-01-6	Trichloroethylene	961	250	1240	112	250	1210	100	2	81-126/15	
75-69-4	Trichlorofluoromethane	ND	250	306	122	250	303	121	1	71-156/21	
96-18-4	1,2,3-Trichloropropane	ND	250	242	97	250	242	97	0	77-120/16	
95-63-6	1,2,4-Trimethylbenzene	ND	250	229	92	250	229	92	0	79-120/18	
108-67-8	1,3,5-Trimethylbenzene	ND	250	237	95	250	236	94	0	79-120/19	
75-01-4	Vinyl Chloride	ND	250	250	100	250	258	103	3	69-159/18	
	m,p-Xylene	ND	500	477	95	500	481	96	1	79-126/15	
95-47-6	o-Xylene	ND	250	229	92	250	231	92	1	80-127/14	

CAS No.	Surrogate Recoveries	MS	MSD	FA49480-2	Limits
1868-53-7	Dibromofluoromethane	107%	105%	104%	83-118%
17060-07-0	1,2-Dichloroethane-D4	106%	106%	105%	79-125%
2037-26-5	Toluene-D8	96%	96%	99%	85-112%
460-00-4	4-Bromofluorobenzene	96%	96%	98%	83-118%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA49466  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA49479-3MS	5E4901.D	50	11/27/17	MM	n/a	n/a	V5E203
FA49479-3MSD	5E4902.D	50	11/27/17	MM	n/a	n/a	V5E203
FA49479-3	5E4896.D	50	11/27/17	MM	n/a	n/a	V5E203

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49466-4

CAS No.	Compound	FA49479-3		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
156-59-2	cis-1,2-Dichloroethylene	605		1250	1880	102	1250	1890	103	1	78-120/15
<hr/>											
CAS No.	Surrogate Recoveries	MS	MSD	FA49479-3		Limits					
1868-53-7	Dibromofluoromethane	110%	109%			108%		83-118%			
17060-07-0	1,2-Dichloroethane-D4	111%	107%			109%		79-125%			
2037-26-5	Toluene-D8	94%	95%			97%		85-112%			
460-00-4	4-Bromofluorobenzene	93%	95%			96%		83-118%			

\* = Outside of Control Limits.

6.3.2  
6

# Memorandum

Environmental  
Resources  
Management

**To:** Dylan Stankus

**From:** Rachel James

**Date:** 30 November 2017

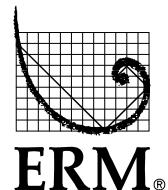
**Subject:** Data Review of Univar Portland NW Yeon  
Groundwater Samples Collected 16 November 2017

**Project Number:** 0436528

**Data Packages:** SGS Accutest Data Package FA49466

---

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)  
[www.erm.com](http://www.erm.com)



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017.

## ***HOLDING TIME AND PRESERVATION EVALUATION***

The samples were prepared and analyzed within the method-prescribed time period from the date of collection. The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C. No qualifications were necessary.

## ***BLANK EVALUATION***

The method and trip blank sample results were nondetected for each of the target analytes. These blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory or during shipment, handling, and storage.

Styrene was detected in field blank sample FB-1-20171116; however, styrene was nondetected in all project samples and qualifications were not necessary. The blank detection is presented in Table 1.

## ***BLANK SPIKE EVALUATION***

The laboratory control samples (LCS) were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

### ***MATRIX SPIKE EVALUATION***

The matrix spike (MS)/matrix spike duplicate (MSD) recoveries and RPDs were within the laboratory's limits of acceptance, indicating acceptable laboratory accuracy and precision and minimal matrix interference.

### ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

### ***FIELD DUPLICATE EVALUATION***

One sample was submitted in duplicate. ERM calculated the relative percent differences (RPDs) between detected results in Table 2. The USEPA has not established control criteria for field duplicate samples; therefore, sample data are not qualified on the basis of field duplicate imprecision.

### ***OVERALL ASSESSMENT***

No results were qualified or rejected. All of the data can be used for decision-making purposes. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

**Table 1**  
*Blank and Associated Suspect Sample Detections*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 16 November 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Blank ID	Associated Samples	Detected Compound	Reported Concentration	Report Limit	Units	ERM Qualifier
FA49466	FB-1-20171116	--	Styrene	6.5	1	µg/L	--

Lab report reviewed: FA49466

**Key:**

µg/L = Micrograms per liter

**Table 2**  
***Field Duplicate Results and Calculated Relative Percent Differences***  
***Groundwater Samples Collected at Univar NW Yeon Facility, 16 November 2017***  
***Univar USA, Inc.***  
***Portland, Oregon***

Lab Package	Primary/ Duplicate Sample ID	Compound	Concentration		Report Limit		Units	RPD
			Sample	Duplicate	Sample	Duplicate		
FA49466	SMW-40-20171116/ SMW-40-20171116-D1	Benzene	2.8	2.8	1.0	1.0	µg/L	0
		1,2-Dichlorobenzene	4.8	4.7	1.0	1.0	µg/L	2.1
		1,1-Dichloroethane	15.9	15.7	1.0	1.0	µg/L	1.3
		1,1-Dichloroethylene	1.7	1.7	1.0	1.0	µg/L	0
		cis-1,2-Dichloroethylene	49.5	48.6	1.0	1.0	µg/L	1.8
		Ethylbenzene	1.8	1.8	1.0	1.0	µg/L	0
		Tetrachloroethylene	16.0	16.2	1.0	1.0	µg/L	1.2
		Toluene	3.8	3.9	1.0	1.0	µg/L	2.6
		Trichloroethylene	40.3	40.6	1.0	1.0	µg/L	0.74
		Vinyl Chloride	25.3	24.2	1.0	1.0	µg/L	4.4

Lab report reviewed: FA49466

**Key:**

RPD = Relative percent difference

µg/L = Micrograms per liter



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2655 Park Center Dr., Suite A  
Simi Valley, CA 93065  
T: +1 805 526 7161  
F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

## LABORATORY REPORT

November 29, 2017

Brendan Robinson  
ERM West, Incorporated  
1001 SW 5th Ave, Suite 1010  
Portland, OR 97204

**RE: Portland, OR (NW YEON)**

Dear Brendan:

Enclosed are the results of the samples submitted to our laboratory on November 13, 2017. For your reference, these analyses have been assigned our service request number P1705714.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

*Kate Kaneko*

By Kate Kaneko at 1:05 pm, 11/29/17

Kate Kaneko  
Project Manager



2655 Park Center Dr., Suite A  
Simi Valley, CA 93065  
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[www.alsglobal.com](http://www.alsglobal.com)

Client: ERM West, Incorporated  
Project: Portland, OR (NW YEON)

Service Request No: P1705714

## CASE NARRATIVE

The samples were received intact under chain of custody on November 13, 2017 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The sample canister for VSP-3B-20171109 (P1705714-002) was found to have a leaking valve. The sample was repressurized, analyzed and the results reported. Results from this sample should be considered estimated and utilized accordingly.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

---

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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[www.alsglobal.com](http://www.alsglobal.com)

## ALS Environmental – Simi Valley

### CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	<a href="http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home">http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home</a>	AZ0694
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Louisiana DEQ (NELAP)	<a href="http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx">http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx</a>	05071
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2016036
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	1177034
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-004
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
PJLA (DoD ELAP)	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	65818 (Testing)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-17-8
Utah DOH (NELAP)	<a href="http://health.utah.gov/lab/environmental-lab-certification/">http://health.utah.gov/lab/environmental-lab-certification/</a>	CA01627201 7-8
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946
Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <a href="http://www.alsglobal.com">www.alsglobal.com</a> , or at the accreditation body's website.		
Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.		

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: ERM West, Incorporated  
 Project ID: Portland, OR (NW YEON)

Service Request: P1705714

Date Received: 11/13/2017  
 Time Received: 09:30

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	2nd Pi (psig)	2nd Pf (psig)	TO-15 - VOC Cans
VSP-2-20171109	P1705714-001	Air	11/9/2017	08:28	SSC00339	-1.87	3.58			X
VSP-3B-20171109	P1705714-002	Air	11/9/2017	08:45	SC01843	0.56	3.81	-0.15	3.17	X
VSP-4A-20171109	P1705714-003	Air	11/9/2017	08:41	SSC00336	0.18	3.68			X
VSP-4B-20171109	P1705714-004	Air	11/9/2017	08:37	SC01058	0.25	3.65			X
VSP-5-20171109	P1705714-005	Air	11/9/2017	08:34	SSC00277	-0.21	3.96			X
SG-7-20171109	P1705714-006	Air	11/9/2017	08:10	SC00894	0.47	3.80			X
SG-8-20171109	P1705714-007	Air	11/9/2017	08:04	SC00114	0.52	3.56			X
SG-9-20171109	P1705714-008	Air	11/9/2017	07:56	SC01028	-0.16	3.64			X



Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/889-8716 Fax 425/889-4138

# Univar Chain of Custody/Laboratory Analysis Request Form

Page 1 of 1

Billed to: **Mark Metcalf**  
**Univar USA**  
**17425 NE Union Hill Rd**  
**Redmond WA 98052**

P1705714

Lab Name:	AL S
Address:	Sini Valley
Telephone:	805 526 7161

## REMARKS:

Invoice:	Date: 03Nov17	SHIPPING: 0.00
Customer: 76330	Wgt: 26.70 LBS	SPECIAL: 0.00
Dept:	COD:	HANDLING: 0.00
PO Number:	DV: 0.00	TOTAL: 0.00

Svc: GND PPD RMGR Master 405647956494  
TRCK: 405647956494

Univar Project Code	PORTLAND, OR (NW YARD) Po # 5074
Contractor Project Manager:	BRENDAN ROBESON
Firm:	ERM
Address:	1001 SW 5TH AVE, SUITE 1610 PORTLAND, OR 97204 Tel: (503) 488-5282

Sampler's Signature:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	TESTERS/CO-TESTERS	TO-15	TESTERS/CO-TESTERS	TESTERS/CO-TESTERS	TESTERS/CO-TESTERS	TESTERS/CO-TESTERS	TESTERS/CO-TESTERS
VSP-2-20171109	11/14/17	0828		Air	1	X					
VSP-3B-20171109	11/17	0845				X	X	X	X	X	
VSP-4A-20171109		0841				X	X	X	X	X	
VSP-4B-20171109		0837				X	X	X	X	X	
VSP-5-20171109		0854				X	X	X	X	X	
SG-7-20171109		0810				X					
SG-8-20171109		0804					X				
SG-9-20171109		0856						X			

Relinquished by/date:	/	Invoice Instructions - Univar to provide to Sampler (Circle code. If multiple codes apply, note in Remarks)			SPECIAL INSTRUCTIONS & COMMENTS: Fax copy of lab results to Envir. Affairs Dept., 425/889-4138		
Received by/date:	/				# EMAIL RESULTS TO: BRENDAN.ROBESON@ERM.COM DYLAN.STANKUS@ERM.COM		
Relinquished by/date:	/						
Received by/date:	/						
Relinquished by/date:	/	Soil Investigation/Remediation 085, 189 or 068, 156					
Received by/date:	/	Water Investigation/Remediation 047, 145 or 165, 167					
Relinquished by/date:	/	Air-Soil Investigation or Remediation 084 or 057					
Received by/date:	/	Waste 171					

REPORT REQUIREMENTS: (circle) I. Routine Report II. Report III. Data Validation Report IV. OLP Deliverable Report

//Requested Report Date:

TURNAROUND TIME: 24 hr    48 hr    5 day     Standard (7-10 working days)    Provide Verbal Prelim. Results    Fax Prelim. Results

Henry Perez 11/13/17 0930

3 16

**ALS Environmental  
Sample Acceptance Check Form**

Client: ERM West, Incorporated

Work order: P1705714

Project: Portland, OR (NW YEON)

Sample(s) received on: 11/13/17

Sample(s) received on: 11/13/17

Date opened: 11/13/17

by: E.PEREZ

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were <b>sample containers</b> properly marked with client sample ID?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Did <b>sample containers</b> arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Were <b>chain-of-custody</b> papers used and filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Did <b>sample container labels</b> and/or tags agree with custody papers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Was <b>sample volume</b> received adequate for analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Are samples within specified holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Were <b>custody seals</b> on outside of cooler/Box/Container?  Location of seal(s)? _____ Sealing Lid?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Were signature and date included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information?  Is there a client indication that the submitted samples are <b>pH</b> preserved?  Were <b>VOA vials</b> checked for presence/absence of air bubbles?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<b>Tubes:</b> Are the tubes capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	<b>Badges:</b> Are the badges properly capped and intact?  Are dual bed badges separated and individually capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Explain any discrepancies: (include lab sample ID numbers):

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-001

Test Code: EPA TO-15 Date Collected: 11/9/17  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 11/13/17  
 Analyst: Anusha Bayyarapu Date Analyzed: 11/18/17  
 Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0070 Liter(s)  
 Test Notes:  
 Container ID: SSC00339

Initial Pressure (psig): -1.87      Final Pressure (psig): 3.58

Container Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	100	ND	49	
75-01-4	Vinyl Chloride	ND	100	ND	40	
74-83-9	Bromomethane	ND	100	ND	26	
75-00-3	Chloroethane	ND	100	ND	38	
67-64-1	Acetone	ND	1,000	ND	430	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	100	ND	18	
75-35-4	1,1-Dichloroethene	ND	100	ND	26	
75-09-2	Methylene Chloride	ND	100	ND	29	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	100	ND	13	
75-15-0	Carbon Disulfide	ND	1,000	ND	330	
156-60-5	trans-1,2-Dichloroethene	ND	100	ND	26	
75-34-3	1,1-Dichloroethane	470	100	120	25	
1634-04-4	Methyl tert-Butyl Ether	ND	100	ND	28	
108-05-4	Vinyl Acetate	ND	1,000	ND	290	
78-93-3	2-Butanone (MEK)	ND	1,000	ND	340	
156-59-2	cis-1,2-Dichloroethene	8,600	100	2,200	26	
67-66-3	Chloroform	ND	100	ND	21	
107-06-2	1,2-Dichloroethane	ND	100	ND	25	
71-55-6	1,1,1-Trichloroethane	7,200	100	1,300	19	
71-43-2	Benzene	ND	100	ND	32	
56-23-5	Carbon Tetrachloride	ND	100	ND	16	
78-87-5	1,2-Dichloropropane	ND	100	ND	22	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-001

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	0.0070 Liter(s)
Test Notes:			
Container ID:	SSC00339		

Initial Pressure (psig): -1.87      Final Pressure (psig): 3.58

Container Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	100	ND	15	
79-01-6	Trichloroethene	<b>6,400</b>	100	<b>1,200</b>	19	
10061-01-5	cis-1,3-Dichloropropene	ND	100	ND	22	
108-10-1	4-Methyl-2-pentanone	ND	100	ND	25	
10061-02-6	trans-1,3-Dichloropropene	ND	100	ND	22	
79-00-5	1,1,2-Trichloroethane	ND	100	ND	19	
108-88-3	Toluene	<b>130</b>	100	<b>35</b>	27	
591-78-6	2-Hexanone	ND	100	ND	25	
124-48-1	Dibromochloromethane	ND	100	ND	12	
106-93-4	1,2-Dibromoethane	ND	100	ND	13	
127-18-4	Tetrachloroethene	<b>15,000</b>	100	<b>2,200</b>	15	
108-90-7	Chlorobenzene	ND	100	ND	22	
100-41-4	Ethylbenzene	ND	100	ND	23	
179601-23-1	m,p-Xylenes	ND	200	ND	47	
75-25-2	Bromoform	ND	100	ND	9.8	
100-42-5	Styrene	ND	100	ND	24	
95-47-6	o-Xylene	ND	100	ND	23	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	ND	15	
541-73-1	1,3-Dichlorobenzene	ND	100	ND	17	
106-46-7	1,4-Dichlorobenzene	ND	100	ND	17	
95-50-1	1,2-Dichlorobenzene	ND	100	ND	17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-3B-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-002

Test Code: EPA TO-15 Date Collected: 11/9/17  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 11/13/17  
 Analyst: Anusha Bayyarapu Date Analyzed: 11/18/17  
 Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.015 Liter(s)  
 Test Notes: !  
 Container ID: SC01843

Initial Pressure (psig): 0.56      Final Pressure (psig): 3.81  
 Initial Pressure 2 (psig): -0.15      Final Pressure 2 (psig): 3.17

Container Dilution Factor: 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	50	ND	24	
75-01-4	Vinyl Chloride	130	50	53	19	
74-83-9	Bromomethane	ND	50	ND	13	
75-00-3	Chloroethane	160	50	62	19	
67-64-1	Acetone	ND	500	ND	210	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	50	ND	8.8	
75-35-4	1,1-Dichloroethene	71	50	18	13	
75-09-2	Methylene Chloride	ND	50	ND	14	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	50	ND	6.5	
75-15-0	Carbon Disulfide	ND	500	ND	160	
156-60-5	trans-1,2-Dichloroethene	ND	50	ND	13	
75-34-3	1,1-Dichloroethane	300	50	75	12	
1634-04-4	Methyl tert-Butyl Ether	ND	50	ND	14	
108-05-4	Vinyl Acetate	ND	500	ND	140	
78-93-3	2-Butanone (MEK)	ND	500	ND	170	
156-59-2	cis-1,2-Dichloroethene	5,100	50	1,300	13	
67-66-3	Chloroform	ND	50	ND	10	
107-06-2	1,2-Dichloroethane	ND	50	ND	12	
71-55-6	1,1,1-Trichloroethane	4,300	50	790	9.1	
71-43-2	Benzene	ND	50	ND	16	
56-23-5	Carbon Tetrachloride	ND	50	ND	7.9	
78-87-5	1,2-Dichloropropane	ND	50	ND	11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

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! = See case narrative.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-3B-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-002

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:	!		
Container ID:	SC01843		

Initial Pressure (psig): 0.56      Final Pressure (psig): 3.81  
 Initial Pressure 2 (psig): -0.15      Final Pressure 2 (psig): 3.17

Container Dilution Factor: 1.49

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	50	ND	7.4	
79-01-6	Trichloroethene	<b>3,700</b>	50	<b>690</b>	9.2	
10061-01-5	cis-1,3-Dichloropropene	ND	50	ND	11	
108-10-1	4-Methyl-2-pentanone	ND	50	ND	12	
10061-02-6	trans-1,3-Dichloropropene	ND	50	ND	11	
79-00-5	1,1,2-Trichloroethane	ND	50	ND	9.1	
108-88-3	Toluene	<b>130</b>	50	<b>34</b>	13	
591-78-6	2-Hexanone	ND	50	ND	12	
124-48-1	Dibromochloromethane	ND	50	ND	5.8	
106-93-4	1,2-Dibromoethane	ND	50	ND	6.5	
127-18-4	Tetrachloroethene	<b>8,400</b>	50	<b>1,200</b>	7.3	
108-90-7	Chlorobenzene	ND	50	ND	11	
100-41-4	Ethylbenzene	<b>100</b>	50	<b>23</b>	11	
179601-23-1	m,p-Xylenes	ND	99	ND	23	
75-25-2	Bromoform	ND	50	ND	4.8	
100-42-5	Styrene	ND	50	ND	12	
95-47-6	o-Xylene	ND	50	ND	11	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	ND	7.2	
541-73-1	1,3-Dichlorobenzene	ND	50	ND	8.3	
106-46-7	1,4-Dichlorobenzene	ND	50	ND	8.3	
95-50-1	1,2-Dichlorobenzene	ND	50	ND	8.3	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

! = See case narrative.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-4A-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-003

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SSC00336		

Initial Pressure (psig): 0.18      Final Pressure (psig): 3.68

Container Dilution Factor: 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.62	ND	0.30	
75-01-4	Vinyl Chloride	<b>160</b>	6.2	<b>63</b>	2.4	
74-83-9	Bromomethane	ND	0.62	ND	0.16	
75-00-3	Chloroethane	<b>150</b>	6.2	<b>56</b>	2.4	
67-64-1	Acetone	ND	6.2	ND	2.6	
75-69-4	Trichlorofluoromethane (CFC 11)	<b>2.1</b>	0.62	<b>0.37</b>	0.11	
75-35-4	1,1-Dichloroethene	<b>790</b>	6.2	<b>200</b>	1.6	
75-09-2	Methylene Chloride	<b>6.4</b>	0.62	<b>1.8</b>	0.18	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.62	ND	0.081	
75-15-0	Carbon Disulfide	ND	6.2	ND	2.0	
156-60-5	trans-1,2-Dichloroethene	<b>3.0</b>	0.62	<b>0.76</b>	0.16	
75-34-3	1,1-Dichloroethane	<b>6.5</b>	0.62	<b>1.6</b>	0.15	
1634-04-4	Methyl tert-Butyl Ether	ND	0.62	ND	0.17	
108-05-4	Vinyl Acetate	ND	6.2	ND	1.8	
78-93-3	2-Butanone (MEK)	ND	6.2	ND	2.1	
156-59-2	cis-1,2-Dichloroethene	<b>54</b>	0.62	<b>14</b>	0.16	
67-66-3	Chloroform	ND	0.62	ND	0.13	
107-06-2	1,2-Dichloroethane	ND	0.62	ND	0.15	
71-55-6	1,1,1-Trichloroethane	<b>15</b>	0.62	<b>2.7</b>	0.11	
71-43-2	Benzene	ND	0.62	ND	0.19	
56-23-5	Carbon Tetrachloride	ND	0.62	ND	0.099	
78-87-5	1,2-Dichloropropane	ND	0.62	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-4A-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-003

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SSC00336		

Initial Pressure (psig): 0.18      Final Pressure (psig): 3.68

Container Dilution Factor: 1.24

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.62	ND	0.093	
79-01-6	Trichloroethene	<b>19</b>	0.62	<b>3.5</b>	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.62	ND	0.14	
108-10-1	4-Methyl-2-pentanone	ND	0.62	ND	0.15	
10061-02-6	trans-1,3-Dichloropropene	ND	0.62	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.62	ND	0.11	
108-88-3	Toluene	<b>1.1</b>	0.62	<b>0.29</b>	0.16	
591-78-6	2-Hexanone	ND	0.62	ND	0.15	
124-48-1	Dibromochloromethane	ND	0.62	ND	0.073	
106-93-4	1,2-Dibromoethane	ND	0.62	ND	0.081	
127-18-4	Tetrachloroethene	<b>85</b>	0.62	<b>13</b>	0.091	
108-90-7	Chlorobenzene	ND	0.62	ND	0.13	
100-41-4	Ethylbenzene	<b>0.77</b>	0.62	<b>0.18</b>	0.14	
179601-23-1	m,p-Xylenes	<b>2.8</b>	1.2	<b>0.65</b>	0.29	
75-25-2	Bromoform	ND	0.62	ND	0.060	
100-42-5	Styrene	ND	0.62	ND	0.15	
95-47-6	o-Xylene	<b>0.90</b>	0.62	<b>0.21</b>	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.62	ND	0.090	
541-73-1	1,3-Dichlorobenzene	ND	0.62	ND	0.10	
106-46-7	1,4-Dichlorobenzene	ND	0.62	ND	0.10	
95-50-1	1,2-Dichlorobenzene	ND	0.62	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-4B-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-004

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SC01058		

Initial Pressure (psig): 0.25      Final Pressure (psig): 3.65

Container Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.62	ND	0.30	
75-01-4	Vinyl Chloride	170	6.2	65	2.4	D
74-83-9	Bromomethane	ND	0.62	ND	0.16	
75-00-3	Chloroethane	110	0.62	42	0.23	
67-64-1	Acetone	ND	6.2	ND	2.6	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.62	ND	0.11	
75-35-4	1,1-Dichloroethene	ND	0.62	ND	0.16	
75-09-2	Methylene Chloride	3.5	0.62	1.0	0.18	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.62	ND	0.080	
75-15-0	Carbon Disulfide	ND	6.2	ND	2.0	
156-60-5	trans-1,2-Dichloroethene	ND	0.62	ND	0.16	
75-34-3	1,1-Dichloroethane	1.7	0.62	0.41	0.15	
1634-04-4	Methyl tert-Butyl Ether	ND	0.62	ND	0.17	
108-05-4	Vinyl Acetate	ND	6.2	ND	1.7	
78-93-3	2-Butanone (MEK)	ND	6.2	ND	2.1	
156-59-2	cis-1,2-Dichloroethene	30	0.62	7.6	0.16	
67-66-3	Chloroform	ND	0.62	ND	0.13	
107-06-2	1,2-Dichloroethane	ND	0.62	ND	0.15	
71-55-6	1,1,1-Trichloroethane	20	0.62	3.6	0.11	
71-43-2	Benzene	ND	0.62	ND	0.19	
56-23-5	Carbon Tetrachloride	ND	0.62	ND	0.098	
78-87-5	1,2-Dichloropropane	ND	0.62	ND	0.13	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-4B-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-004

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SC01058		

Initial Pressure (psig): 0.25      Final Pressure (psig): 3.65

Container Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.62	ND	0.092	
79-01-6	Trichloroethene	27	0.62	5.0	0.11	
10061-01-5	cis-1,3-Dichloropropene	ND	0.62	ND	0.14	
108-10-1	4-Methyl-2-pentanone	ND	0.62	ND	0.15	
10061-02-6	trans-1,3-Dichloropropene	ND	0.62	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.62	ND	0.11	
108-88-3	Toluene	1.6	0.62	0.42	0.16	
591-78-6	2-Hexanone	ND	0.62	ND	0.15	
124-48-1	Dibromochloromethane	ND	0.62	ND	0.072	
106-93-4	1,2-Dibromoethane	ND	0.62	ND	0.080	
127-18-4	Tetrachloroethene	110	0.62	17	0.091	
108-90-7	Chlorobenzene	ND	0.62	ND	0.13	
100-41-4	Ethylbenzene	0.86	0.62	0.20	0.14	
179601-23-1	m,p-Xylenes	3.1	1.2	0.71	0.28	
75-25-2	Bromoform	ND	0.62	ND	0.060	
100-42-5	Styrene	ND	0.62	ND	0.14	
95-47-6	o-Xylene	1.0	0.62	0.23	0.14	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.62	ND	0.090	
541-73-1	1,3-Dichlorobenzene	ND	0.62	ND	0.10	
106-46-7	1,4-Dichlorobenzene	ND	0.62	ND	0.10	
95-50-1	1,2-Dichlorobenzene	ND	0.62	ND	0.10	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-5-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-005

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SSC00277		

Initial Pressure (psig): -0.21      Final Pressure (psig): 3.96

Container Dilution Factor: 1.29

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.65	ND	0.31	
75-01-4	Vinyl Chloride	150	6.5	58	2.5	D
74-83-9	Bromomethane	ND	0.65	ND	0.17	
75-00-3	Chloroethane	100	0.65	40	0.24	
67-64-1	Acetone	ND	6.5	ND	2.7	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.65	ND	0.11	
75-35-4	1,1-Dichloroethene	ND	0.65	ND	0.16	
75-09-2	Methylene Chloride	ND	0.65	ND	0.19	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.65	ND	0.084	
75-15-0	Carbon Disulfide	ND	6.5	ND	2.1	
156-60-5	trans-1,2-Dichloroethene	ND	0.65	ND	0.16	
75-34-3	1,1-Dichloroethane	3.2	0.65	0.80	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.65	ND	0.18	
108-05-4	Vinyl Acetate	ND	6.5	ND	1.8	
78-93-3	2-Butanone (MEK)	ND	6.5	ND	2.2	
156-59-2	cis-1,2-Dichloroethene	55	0.65	14	0.16	
67-66-3	Chloroform	ND	0.65	ND	0.13	
107-06-2	1,2-Dichloroethane	ND	0.65	ND	0.16	
71-55-6	1,1,1-Trichloroethane	40	0.65	7.3	0.12	
71-43-2	Benzene	ND	0.65	ND	0.20	
56-23-5	Carbon Tetrachloride	ND	0.65	ND	0.10	
78-87-5	1,2-Dichloropropane	ND	0.65	ND	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-5-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-005

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.00 Liter(s) 0.10 Liter(s)
Test Notes:			
Container ID:	SSC00277		

Initial Pressure (psig): -0.21      Final Pressure (psig): 3.96

Container Dilution Factor: 1.29

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.65	ND	0.096	
79-01-6	Trichloroethene	47	0.65	8.8	0.12	
10061-01-5	cis-1,3-Dichloropropene	ND	0.65	ND	0.14	
108-10-1	4-Methyl-2-pentanone	ND	0.65	ND	0.16	
10061-02-6	trans-1,3-Dichloropropene	ND	0.65	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.65	ND	0.12	
108-88-3	Toluene	2.0	0.65	0.54	0.17	
591-78-6	2-Hexanone	ND	0.65	ND	0.16	
124-48-1	Dibromochloromethane	ND	0.65	ND	0.076	
106-93-4	1,2-Dibromoethane	ND	0.65	ND	0.084	
127-18-4	Tetrachloroethene	230	6.5	34	0.95	D
108-90-7	Chlorobenzene	ND	0.65	ND	0.14	
100-41-4	Ethylbenzene	1.1	0.65	0.25	0.15	
179601-23-1	m,p-Xylenes	3.7	1.3	0.85	0.30	
75-25-2	Bromoform	ND	0.65	ND	0.062	
100-42-5	Styrene	ND	0.65	ND	0.15	
95-47-6	o-Xylene	1.2	0.65	0.28	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.65	ND	0.094	
541-73-1	1,3-Dichlorobenzene	ND	0.65	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.65	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.65	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-7-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-006

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.0025 Liter(s)
Test Notes:			
Container ID:	SC00894		

Initial Pressure (psig): 0.47      Final Pressure (psig): 3.80

Container Dilution Factor: 1.22

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	240	ND	120	
75-01-4	Vinyl Chloride	ND	240	ND	95	
74-83-9	Bromomethane	ND	240	ND	63	
75-00-3	Chloroethane	ND	240	ND	93	
67-64-1	Acetone	ND	2,400	ND	1,000	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	240	ND	43	
75-35-4	1,1-Dichloroethene	<b>310</b>	240	<b>79</b>	62	
75-09-2	Methylene Chloride	ND	240	ND	70	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	240	ND	32	
75-15-0	Carbon Disulfide	ND	2,400	ND	780	
156-60-5	trans-1,2-Dichloroethene	ND	240	ND	62	
75-34-3	1,1-Dichloroethane	<b>1,700</b>	240	<b>430</b>	60	
1634-04-4	Methyl tert-Butyl Ether	ND	240	ND	68	
108-05-4	Vinyl Acetate	ND	2,400	ND	690	
78-93-3	2-Butanone (MEK)	ND	2,400	ND	830	
156-59-2	cis-1,2-Dichloroethene	<b>25,000</b>	240	<b>6,400</b>	62	
67-66-3	Chloroform	ND	240	ND	50	
107-06-2	1,2-Dichloroethane	ND	240	ND	60	
71-55-6	1,1,1-Trichloroethane	<b>29,000</b>	240	<b>5,300</b>	45	
71-43-2	Benzene	ND	240	ND	76	
56-23-5	Carbon Tetrachloride	ND	240	ND	39	
78-87-5	1,2-Dichloropropane	ND	240	ND	53	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-7-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-006

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.0025 Liter(s)
Test Notes:			
Container ID:	SC00894		

Initial Pressure (psig): 0.47      Final Pressure (psig): 3.80

Container Dilution Factor: 1.22

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	240	ND	36	
79-01-6	Trichloroethene	<b>17,000</b>	240	<b>3,200</b>	45	
10061-01-5	cis-1,3-Dichloropropene	ND	240	ND	54	
108-10-1	4-Methyl-2-pentanone	ND	240	ND	60	
10061-02-6	trans-1,3-Dichloropropene	ND	240	ND	54	
79-00-5	1,1,2-Trichloroethane	ND	240	ND	45	
108-88-3	Toluene	ND	240	ND	65	
591-78-6	2-Hexanone	ND	240	ND	60	
124-48-1	Dibromochloromethane	ND	240	ND	29	
106-93-4	1,2-Dibromoethane	ND	240	ND	32	
127-18-4	Tetrachloroethene	<b>37,000</b>	240	<b>5,400</b>	36	
108-90-7	Chlorobenzene	ND	240	ND	53	
100-41-4	Ethylbenzene	ND	240	ND	56	
179601-23-1	m,p-Xylenes	ND	490	ND	110	
75-25-2	Bromoform	ND	240	ND	24	
100-42-5	Styrene	ND	240	ND	57	
95-47-6	o-Xylene	ND	240	ND	56	
79-34-5	1,1,2,2-Tetrachloroethane	ND	240	ND	36	
541-73-1	1,3-Dichlorobenzene	ND	240	ND	41	
106-46-7	1,4-Dichlorobenzene	ND	240	ND	41	
95-50-1	1,2-Dichlorobenzene	ND	240	ND	41	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-8-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-007

Test Code: EPA TO-15 Date Collected: 11/9/17  
 Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8 Date Received: 11/13/17  
 Analyst: Anusha Bayyarapu Date Analyzed: 11/18/17 & 11/20/17  
 Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 0.015 Liter(s)  
 Test Notes:  
 Container ID: SC00114 0.0050 Liter(s)

Initial Pressure (psig): 0.52      Final Pressure (psig): 3.56

Container Dilution Factor: 1.20

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	40	ND	19	
75-01-4	Vinyl Chloride	92	40	36	16	
74-83-9	Bromomethane	ND	40	ND	10	
75-00-3	Chloroethane	ND	40	ND	15	
67-64-1	Acetone	ND	400	ND	170	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	40	ND	7.1	
75-35-4	1,1-Dichloroethene	320	40	81	10	
75-09-2	Methylene Chloride	ND	40	ND	12	
76-13-1	Trichlorotrifluoroethane (CFC 113)	67	40	8.8	5.2	
75-15-0	Carbon Disulfide	ND	400	ND	130	
156-60-5	trans-1,2-Dichloroethene	180	40	46	10	
75-34-3	1,1-Dichloroethane	2,700	40	660	9.9	
1634-04-4	Methyl tert-Butyl Ether	ND	40	ND	11	
108-05-4	Vinyl Acetate	ND	400	ND	110	
78-93-3	2-Butanone (MEK)	ND	400	ND	140	
156-59-2	cis-1,2-Dichloroethene	13,000	120	3,300	30	D
67-66-3	Chloroform	ND	40	ND	8.2	
107-06-2	1,2-Dichloroethane	ND	40	ND	9.9	
71-55-6	1,1,1-Trichloroethane	7,200	120	1,300	22	D
71-43-2	Benzene	ND	40	ND	13	
56-23-5	Carbon Tetrachloride	ND	40	ND	6.4	
78-87-5	1,2-Dichloropropane	ND	40	ND	8.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-8-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-007

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17 & 11/20/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s) 0.0050 Liter(s)
Test Notes:			
Container ID:	SC00114		

Initial Pressure (psig): 0.52      Final Pressure (psig): 3.56

Container Dilution Factor: 1.20

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	40	ND	6.0	
79-01-6	Trichloroethene	<b>3,100</b>	40	<b>580</b>	7.4	
10061-01-5	cis-1,3-Dichloropropene	ND	40	ND	8.8	
108-10-1	4-Methyl-2-pentanone	ND	40	ND	9.8	
10061-02-6	trans-1,3-Dichloropropene	ND	40	ND	8.8	
79-00-5	1,1,2-Trichloroethane	ND	40	ND	7.3	
108-88-3	Toluene	ND	40	ND	11	
591-78-6	2-Hexanone	ND	40	ND	9.8	
124-48-1	Dibromochloromethane	ND	40	ND	4.7	
106-93-4	1,2-Dibromoethane	ND	40	ND	5.2	
127-18-4	Tetrachloroethene	<b>5,300</b>	40	<b>780</b>	5.9	
108-90-7	Chlorobenzene	ND	40	ND	8.7	
100-41-4	Ethylbenzene	ND	40	ND	9.2	
179601-23-1	m,p-Xylenes	ND	80	ND	18	
75-25-2	Bromoform	ND	40	ND	3.9	
100-42-5	Styrene	ND	40	ND	9.4	
95-47-6	o-Xylene	ND	40	ND	9.2	
79-34-5	1,1,2,2-Tetrachloroethane	ND	40	ND	5.8	
541-73-1	1,3-Dichlorobenzene	ND	40	ND	6.7	
106-46-7	1,4-Dichlorobenzene	ND	40	ND	6.7	
95-50-1	1,2-Dichlorobenzene	ND	40	ND	6.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-9-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-008

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:			
Container ID:	SC01028		

Initial Pressure (psig): -0.16      Final Pressure (psig): 3.64

Container Dilution Factor: 1.26

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	42	ND	20	
75-01-4	Vinyl Chloride	99	42	39	16	
74-83-9	Bromomethane	ND	42	ND	11	
75-00-3	Chloroethane	ND	42	ND	16	
67-64-1	Acetone	ND	420	ND	180	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	42	ND	7.5	
75-35-4	1,1-Dichloroethene	ND	42	ND	11	
75-09-2	Methylene Chloride	ND	42	ND	12	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	42	ND	5.5	
75-15-0	Carbon Disulfide	ND	420	ND	130	
156-60-5	trans-1,2-Dichloroethene	ND	42	ND	11	
75-34-3	1,1-Dichloroethane	ND	42	ND	10	
1634-04-4	Methyl tert-Butyl Ether	ND	42	ND	12	
108-05-4	Vinyl Acetate	ND	420	ND	120	
78-93-3	2-Butanone (MEK)	ND	420	ND	140	
156-59-2	cis-1,2-Dichloroethene	50	42	13	11	
67-66-3	Chloroform	ND	42	ND	8.6	
107-06-2	1,2-Dichloroethane	ND	42	ND	10	
71-55-6	1,1,1-Trichloroethane	ND	42	ND	7.7	
71-43-2	Benzene	ND	42	ND	13	
56-23-5	Carbon Tetrachloride	ND	42	ND	6.7	
78-87-5	1,2-Dichloropropane	ND	42	ND	9.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** SG-9-20171109  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714  
 ALS Sample ID: P1705714-008

Test Code:	EPA TO-15	Date Collected:	11/9/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	11/13/17
Analyst:	Anusha Bayyarapu	Date Analyzed:	11/18/17
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:			
Container ID:	SC01028		

Initial Pressure (psig): -0.16      Final Pressure (psig): 3.64

Container Dilution Factor: 1.26

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	42	ND	6.3	
79-01-6	Trichloroethene	ND	42	ND	7.8	
10061-01-5	cis-1,3-Dichloropropene	ND	42	ND	9.3	
108-10-1	4-Methyl-2-pentanone	ND	42	ND	10	
10061-02-6	trans-1,3-Dichloropropene	ND	42	ND	9.3	
79-00-5	1,1,2-Trichloroethane	ND	42	ND	7.7	
108-88-3	Toluene	ND	42	ND	11	
591-78-6	2-Hexanone	ND	42	ND	10	
124-48-1	Dibromochloromethane	ND	42	ND	4.9	
106-93-4	1,2-Dibromoethane	ND	42	ND	5.5	
127-18-4	Tetrachloroethene	ND	42	ND	6.2	
108-90-7	Chlorobenzene	ND	42	ND	9.1	
100-41-4	Ethylbenzene	<b>50</b>	42	<b>11</b>	9.7	
179601-23-1	m,p-Xylenes	ND	84	ND	19	
75-25-2	Bromoform	ND	42	ND	4.1	
100-42-5	Styrene	ND	42	ND	9.9	
95-47-6	o-Xylene	ND	42	ND	9.7	
79-34-5	1,1,2,2-Tetrachloroethane	ND	42	ND	6.1	
541-73-1	1,3-Dichlorobenzene	ND	42	ND	7.0	
106-46-7	1,4-Dichlorobenzene	ND	42	ND	7.0	
95-50-1	1,2-Dichlorobenzene	ND	42	ND	7.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171118-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyapu

Date Analyzed: 11/18/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.50	ND	0.24	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	ND	0.089	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
67-66-3	Chloroform	ND	0.50	ND	0.10	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171118-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 11/18/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171120-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyapu

Date Analyzed: 11/20/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.50	ND	0.24	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	ND	0.089	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
67-66-3	Chloroform	ND	0.50	ND	0.10	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171120-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 11/20/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** ERM West, Incorporated  
**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

Test Code:	EPA TO-15	
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date(s) Collected: 11/9/17
Analyst:	Anusha Bayyarapu	Date(s) Received: 11/13/17
Sample Type:	6.0 L Silonite Canister(s) / 6.0 L Summa Canister(s)	Date(s) Analyzed: 11/18 - 11/20/17
Test Notes:		

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P171118-MB	101	101	93	70-130	
Method Blank	P171120-MB	100	102	93	70-130	
Lab Control Sample	P171118-LCS	97	100	93	70-130	
Lab Control Sample	P171120-LCS	96	100	94	70-130	
VSP-2-20171109	P1705714-001	98	100	92	70-130	
VSP-3B-20171109	P1705714-002	99	99	94	70-130	
VSP-4A-20171109	P1705714-003	99	97	92	70-130	
VSP-4B-20171109	P1705714-004	101	96	90	70-130	
VSP-5-20171109	P1705714-005	100	95	88	70-130	
SG-7-20171109	P1705714-006	98	100	94	70-130	
SG-8-20171109	P1705714-007	96	99	92	70-130	
SG-9-20171109	P1705714-008	92	76	72	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171118-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 11/18/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount	Result µg/m³	% Recovery	ALS	
		µg/m³			Acceptance Limits	Data Qualifier
74-87-3	Chloromethane	210	181	86	47-140	
75-01-4	Vinyl Chloride	211	189	90	63-127	
74-83-9	Bromomethane	210	171	81	63-132	
75-00-3	Chloroethane	210	188	90	68-129	
67-64-1	Acetone	1,050	890	85	63-124	
75-69-4	Trichlorofluoromethane (CFC 11)	208	166	80	65-113	
75-35-4	1,1-Dichloroethene	213	181	85	72-118	
75-09-2	Methylene Chloride	213	176	83	67-116	
76-13-1	Trichlorotrifluoroethane (CFC 113)	214	170	79	68-113	
75-15-0	Carbon Disulfide	214	173	81	68-120	
156-60-5	trans-1,2-Dichloroethene	214	196	92	71-125	
75-34-3	1,1-Dichloroethane	212	175	83	68-118	
1634-04-4	Methyl tert-Butyl Ether	213	179	84	60-123	
108-05-4	Vinyl Acetate	1,060	927	87	73-135	
78-93-3	2-Butanone (MEK)	212	189	89	70-129	
156-59-2	cis-1,2-Dichloroethene	212	181	85	69-121	
67-66-3	Chloroform	212	170	80	69-113	
107-06-2	1,2-Dichloroethane	212	163	77	62-120	
71-55-6	1,1,1-Trichloroethane	212	178	84	65-116	
71-43-2	Benzene	213	173	81	66-111	
56-23-5	Carbon Tetrachloride	214	179	84	64-122	
78-87-5	1,2-Dichloropropane	212	188	89	69-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171118-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 11/18/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	ALS		
				% Recovery	Acceptance Limits	Data Qualifier
75-27-4	Bromodichloromethane	214	191	89	69-123	
79-01-6	Trichloroethene	212	169	80	69-112	
10061-01-5	cis-1,3-Dichloropropene	208	191	92	74-129	
108-10-1	4-Methyl-2-pentanone	213	197	92	66-138	
10061-02-6	trans-1,3-Dichloropropene	213	210	99	75-130	
79-00-5	1,1,2-Trichloroethane	212	189	89	73-117	
108-88-3	Toluene	211	169	80	66-114	
591-78-6	2-Hexanone	211	195	92	58-146	
124-48-1	Dibromochloromethane	212	187	88	67-130	
106-93-4	1,2-Dibromoethane	211	189	90	70-127	
127-18-4	Tetrachloroethene	212	171	81	62-119	
108-90-7	Chlorobenzene	212	171	81	66-115	
100-41-4	Ethylbenzene	212	174	82	69-117	
179601-23-1	m,p-Xylenes	424	345	81	67-117	
75-25-2	Bromoform	212	196	92	67-135	
100-42-5	Styrene	211	191	91	70-128	
95-47-6	o-Xylene	211	172	82	67-118	
79-34-5	1,1,2,2-Tetrachloroethane	212	185	87	70-125	
541-73-1	1,3-Dichlorobenzene	212	185	87	70-124	
106-46-7	1,4-Dichlorobenzene	214	188	88	63-124	
95-50-1	1,2-Dichlorobenzene	214	188	88	66-125	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171120-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyapu

Date Analyzed: 11/20/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount	Result µg/m³	% Recovery	ALS	
		µg/m³			Acceptance Limits	Data Qualifier
74-87-3	Chloromethane	210	182	87	47-140	
75-01-4	Vinyl Chloride	211	188	89	63-127	
74-83-9	Bromomethane	210	173	82	63-132	
75-00-3	Chloroethane	210	187	89	68-129	
67-64-1	Acetone	1,050	886	84	63-124	
75-69-4	Trichlorofluoromethane (CFC 11)	208	162	78	65-113	
75-35-4	1,1-Dichloroethene	213	178	84	72-118	
75-09-2	Methylene Chloride	213	174	82	67-116	
76-13-1	Trichlorotrifluoroethane (CFC 113)	214	168	79	68-113	
75-15-0	Carbon Disulfide	214	172	80	68-120	
156-60-5	trans-1,2-Dichloroethene	214	193	90	71-125	
75-34-3	1,1-Dichloroethane	212	171	81	68-118	
1634-04-4	Methyl tert-Butyl Ether	213	177	83	60-123	
108-05-4	Vinyl Acetate	1,060	891	84	73-135	
78-93-3	2-Butanone (MEK)	212	186	88	70-129	
156-59-2	cis-1,2-Dichloroethene	212	178	84	69-121	
67-66-3	Chloroform	212	166	78	69-113	
107-06-2	1,2-Dichloroethane	212	160	75	62-120	
71-55-6	1,1,1-Trichloroethane	212	177	83	65-116	
71-43-2	Benzene	213	171	80	66-111	
56-23-5	Carbon Tetrachloride	214	178	83	64-122	
78-87-5	1,2-Dichloropropane	212	186	88	69-121	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

**Client Project ID:** Portland, OR (NW YEON)

ALS Project ID: P1705714

ALS Sample ID: P171120-LCS

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 11/20/17

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS	
					Acceptance Limits	Data Qualifier
75-27-4	Bromodichloromethane	214	188	88	69-123	
79-01-6	Trichloroethene	212	165	78	69-112	
10061-01-5	cis-1,3-Dichloropropene	208	188	90	74-129	
108-10-1	4-Methyl-2-pentanone	213	196	92	66-138	
10061-02-6	trans-1,3-Dichloropropene	213	209	98	75-130	
79-00-5	1,1,2-Trichloroethane	212	189	89	73-117	
108-88-3	Toluene	211	165	78	66-114	
591-78-6	2-Hexanone	211	189	90	58-146	
124-48-1	Dibromochloromethane	212	181	85	67-130	
106-93-4	1,2-Dibromoethane	211	184	87	70-127	
127-18-4	Tetrachloroethene	212	165	78	62-119	
108-90-7	Chlorobenzene	212	167	79	66-115	
100-41-4	Ethylbenzene	212	170	80	69-117	
179601-23-1	m,p-Xylenes	424	336	79	67-117	
75-25-2	Bromoform	212	191	90	67-135	
100-42-5	Styrene	211	187	89	70-128	
95-47-6	o-Xylene	211	168	80	67-118	
79-34-5	1,1,2,2-Tetrachloroethane	212	183	86	70-125	
541-73-1	1,3-Dichlorobenzene	212	181	85	70-124	
106-46-7	1,4-Dichlorobenzene	214	184	86	63-124	
95-50-1	1,2-Dichlorobenzene	214	183	86	66-125	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# Memorandum

Environmental  
Resources  
Management

To: Tanya Battye

From: Rachel James

Date: 7 December 2017

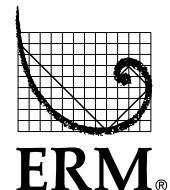
Subject: Data Review of Univar NW Yeon Soil Vapor Extraction Samples Collected 9 November 2017

Project Number: 0436528

Data Package: ALS Data Package P1705714

---

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017.

## ***HOLDING TIME AND PRESERVATION EVALUATION***

The samples were prepared and analyzed within the method-prescribed time period from the date of collection. The sample shipments were received at the laboratory within the method-prescribed temperature and preservation requirements. None of the data were qualified based on holding time or preservation exceedances.

## ***CANISTER VACUUM EVALUATION***

The laboratory noted that the summa canister for sample VSP-3B-20171109 had a leaking valve. The canister was re-pressurized and analyzed. The results for this sample were qualified as estimates (J/UJ) based upon the canister leak. Additionally, the canisters for samples VSP-4A-20171119, VSP-4B-20171119, SG-7-20171109, and SG-8-20171119 were received at ambient pressure. The results for these samples are considered estimates (J/UJ). The qualified data is presented in Table 1.

## ***BLANK EVALUATION***

The method blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory.

### ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

### ***MATRIX SPIKE EVALUATION***

Matrix spikes are not performed for air samples.

### ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

### ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

### ***OVERALL ASSESSMENT***

No results were qualified or rejected. All of the data can be used for decision-making purposes. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

**Table 1**  
**Canister Vacuum Discrepancies**  
*Soil Vapor Extraction Samples Collected 9 November 2017*  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Method	Pressure At Receipt	Units	ERM Qualifier
P1705714	VSP-3B-20171109	TO-15	0.56	psi	J/UJ
	VSP-4A-20171109	TO-15	0.18	psi	J/UJ
	VSP-4B-20171109	TO-15	0.25	psi	J/UJ
	SG-7-20171109	TO-15	0.47	psi	J/UJ
	SG-8-20171109	TO-15	0.52	psi	J/UJ

Lab reports reviewed: P1705714

**Key:**

psi = Pounds per square inch

J/UJ = Detected results are estimated; nondetected results are estimated at the report limit



ACCUTEST

Southeast

12/05/17

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VERIFICATION, TESTING AND CERTIFICATION COMPANY.



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Automated Report

## Technical Report for

Univar

ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
S074

SGS Accutest Job Number: FA49256

Sampling Date: 11/09/17



Report to:

ERM  
1001 SW 5th Ave Suite 1010  
Portland, OR 97204  
Brendan.Robinson@erm.com; Dylan.Stankus@erm.com;  
tanya.battye@erm.com  
ATTN: Brendan Robinson

Total number of pages in report: 31



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Elvin Kumar 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(L-A-B L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, GA, IA, KY, MA, NV, OK, OR, UT, WA

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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Summary of Hits .....</b>	<b>6</b>
<b>Section 4: Sample Results .....</b>	<b>7</b>
<b>4.1: FA49256-1: W-1-20171109 .....</b>	<b>8</b>
<b>4.2: FA49256-2: W-2-20171109 .....</b>	<b>10</b>
<b>4.3: FA49256-3: TRIP BLANK .....</b>	<b>13</b>
<b>Section 5: Misc. Forms .....</b>	<b>15</b>
<b>5.1: Chain of Custody .....</b>	<b>16</b>
<b>Section 6: MS Volatiles - QC Data Summaries .....</b>	<b>18</b>
<b>6.1: Method Blank Summary .....</b>	<b>19</b>
<b>6.2: Blank Spike Summary .....</b>	<b>22</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>25</b>
<b>Section 7: General Chemistry - QC Data Summaries .....</b>	<b>28</b>
<b>7.1: Method Blank and Spike Results Summary .....</b>	<b>29</b>
<b>7.2: Matrix Spike Results Summary .....</b>	<b>30</b>
<b>7.3: Matrix Spike Duplicate Results Summary .....</b>	<b>31</b>



## Sample Summary

Univar

Job No: FA49256

ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA49256-1	11/09/17	06:36 BR	11/10/17	AQ Water	W-1-20171109
FA49256-2	11/09/17	06:54 BR	11/10/17	AQ Water	W-2-20171109
FA49256-3	11/09/17	00:00 BR	11/10/17	AQ Trip Blank Water	TRIP BLANK

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Univar

**Job No:** FA49256

**Site:** ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR **Report Date** 12/5/2017 7:17:17 PM

2 Samples and 1 Trip Blank were collected on 11/09/2017 and were received at SGS Accutest Southeast (SASE) on 11/10/2017 properly preserved, at 2 Deg. C and intact. These Samples received an SASE job number of FA49256. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VI1494

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA48985-21MS, FA48985-21MSD were used as the QC samples indicated.

Matrix Spike / Matrix Spike Duplicate Recovery(s) for Chloroethane are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

FA49256-1 for Carbon Tetrachloride: Associated CCV outside of control limits high, sample was ND.

FA49256-1: Sample was not preserved to a pH < 2.

FA49256-2 for Carbon Tetrachloride: Associated CCV outside of control limits high, sample was ND.

FA49256-2: Sample was not preserved to a pH < 2.

FA49256-3 for Carbon Tetrachloride: Associated CCV outside of control limits high, sample was ND.

FA49256-3: Sample was not preserved to a pH < 2.

**Matrix:** AQ

**Batch ID:** VI1495

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA49280-13MS, FA49280-13MSD were used as the QC samples indicated.

Blank Spike Recovery(s) for Chloroethane are outside control limits. Sporadic marginal failure.

Matrix Spike / Matrix Spike Duplicate Recovery(s) for Chloroethane are outside control limits. Probable cause is due to matrix interference.

RPD(s) for MSD for Chloroethane are outside control limits for sample FA49280-13MSD. Probable cause is due to sample non-homogeneity.

FA49256-1: Sample was not preserved to a pH < 2.

FA49256-1 for Chloroethane: Associated BS recovery outside control limits.

### General Chemistry By Method EPA 1664A

**Matrix:** AQ

**Batch ID:** GP30746

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Matrix Spike Recovery(s) for HEM Oil and Grease are outside control limits. Spike recovery indicates possible matrix interference. For method performance in a clean matrix, refer to Blank Spike.

### General Chemistry By Method EPA 335.4/SW 9012B

**Matrix:** AQ

**Batch ID:** GP30617

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA49199-1MS, FA49199-1MSD were used as the QC samples for Cyanide, Total.

SGS Accutest (SASE) certifies that this report meets the project requirements for analytical data produced for the samples as received at SASE and as stated on the COC. SASE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SASE Quality Manual except as noted above. This report is to be used in its entirety. SASE is not responsible for any assumptions of data quality if partial data packages are used

Narrative prepared by:

Date: December 5, 2017

Lovelie Metzgar, QA Officer (signature on file)

## Summary of Hits

Page 1 of 1

Job Number: FA49256

Account: Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Collected: 11/09/17

3

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

### FA49256-1 W-1-20171109

Benzene <sup>a</sup>	7.7	1.0	0.31	ug/l	SW846 8260B
Chloroethane <sup>b</sup>	90.1	10	3.3	ug/l	SW846 8260B
1,2-Dichlorobenzene <sup>a</sup>	1.4	1.0	0.32	ug/l	SW846 8260B
1,1-Dichloroethane <sup>a</sup>	16.9	1.0	0.34	ug/l	SW846 8260B
1,1-Dichloroethylene <sup>a</sup>	2.0	1.0	0.32	ug/l	SW846 8260B
cis-1,2-Dichloroethylene <sup>a</sup>	79.2	1.0	0.28	ug/l	SW846 8260B
trans-1,2-Dichloroethylene <sup>a</sup>	0.60 J	1.0	0.22	ug/l	SW846 8260B
Ethylbenzene <sup>a</sup>	30.7	1.0	0.36	ug/l	SW846 8260B
Toluene <sup>a</sup>	7.7	1.0	0.30	ug/l	SW846 8260B
1,1,1-Trichloroethane <sup>a</sup>	6.3	1.0	0.25	ug/l	SW846 8260B
Vinyl Chloride <sup>a</sup>	85.5	1.0	0.41	ug/l	SW846 8260B
m,p-Xylene <sup>a</sup>	41.9	2.0	0.47	ug/l	SW846 8260B
o-Xylene <sup>a</sup>	14.4	1.0	0.26	ug/l	SW846 8260B

### FA49256-2 W-2-20171109

No hits reported in this sample.

### FA49256-3 TRIP BLANK

No hits reported in this sample.

(a) Sample was not preserved to a pH < 2.

(b) Sample was not preserved to a pH < 2. Associated BS recovery outside control limits.



Sample Results

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Report of Analysis

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**Report of Analysis**

Page 1 of 2

<b>Client Sample ID:</b>	W-1-20171109	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-1	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	I51464.D	1	11/14/17 16:49	AJ	n/a	n/a	VI1494
Run #2 <sup>a</sup>	I51476.D	5	11/15/17 11:19	AJ	n/a	n/a	VI1495

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	7.7	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride <sup>b</sup>	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane <sup>c</sup>	90.1 <sup>d</sup>	10	3.3	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	1.4	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	16.9	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	2.0	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	79.2	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.60	1.0	0.22	ug/l	J
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	30.7	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-1-20171109	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-1	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	7.7	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	6.3	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	85.5	1.0	0.41	ug/l	
	m,p-Xylene	41.9	2.0	0.47	ug/l	
95-47-6	o-Xylene	14.4	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	112%	108%	79-125%
2037-26-5	Toluene-D8	97%	97%	85-112%
460-00-4	4-Bromofluorobenzene	99%	98%	83-118%

- (a) Sample was not preserved to a pH < 2.  
 (b) Associated CCV outside of control limits high, sample was ND.  
 (c) Associated BS recovery outside control limits.  
 (d) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.2  
4**Client Sample ID:** W-2-20171109**Lab Sample ID:** FA49256-2**Date Sampled:** 11/09/17**Matrix:** AQ - Water**Date Received:** 11/10/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	I51465.D	1	11/14/17 17:12	AJ	n/a	n/a	VI1494
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride <sup>b</sup>	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-2-20171109	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-2	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	109%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

- (a) Sample was not preserved to a pH < 2.  
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b>	W-2-20171109	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-2	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By Method
Cyanide, Total	0.0030 U	0.010	0.0030	mg/l	1	11/15/17 21:06 KH	EPA 335.4/SW 9012B
HEM Oil and Grease	1.5 U	5.3	1.5	mg/l	1	12/02/17 11:00 CH	EPA 1664A

4.2  
4

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 J = Indicates a result > = MDL but < RL

**Report of Analysis**

Page 1 of 2

4.3  
4

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-3	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	I51466.D	1	11/14/17 17:35	AJ	n/a	n/a	VI1494
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride <sup>b</sup>	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	11/09/17
<b>Lab Sample ID:</b>	FA49256-3	<b>Date Received:</b>	11/10/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	112%		79-125%
2037-26-5	Toluene-D8	97%		85-112%
460-00-4	4-Bromofluorobenzene	99%		83-118%

- (a) Sample was not preserved to a pH < 2.  
(b) Associated CCV outside of control limits high, sample was ND.

ND = Not detected      MDL = Method Detection Limit  
RL = Reporting Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

**Misc. Forms**

5

**Custody Documents and Other Forms**

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Includes the following where applicable:

- Chain of Custody



**Univar USA Inc.**  
**Univar Environmental Affairs**  
**Tel 425/889-3716 Fax 425/889-4139**

**Univar Chain of Custody/Laboratory Analysis Reference Form**

Page \_\_\_\_\_ of \_\_\_\_\_

FAU92510

**Univar Project Site:** PORTLAND, OR (NW 45th) Po # 5074

Bill to: Mark Metcalf  
Univar USA  
17425 NE Union Hill Rd  
Redmond WA 98052

Lab Name: Accutest  
Address: Orlando, FL  
Telephone: 407-425-6700

Univar Project #/Site: <b>PORTLAND, OR (NW 46th) Po &lt;5074&gt;</b>	Location/WT: 78052	Telephone: <b>407-425-6700</b>											
Contractor Project Manager: <b>BRENDAN ROBESON</b>	REMARKS:												
Firm: <b>ERM</b>													
Address: <b>1001 SW 6TH AVE, SUITE 1010 PORTLAND, OR 97204</b>													
Tel: <b>(503) 488-5282</b>													
Sampler's Signature:													
SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	TESTED FOR CONTAMINANTS	RESULTS	TESTED FOR CONTAMINANTS	RESULTS	TESTED FOR CONTAMINANTS	RESULTS	TESTED FOR CONTAMINANTS	RESULTS	
W-1-20171109	1/9/	0630		Water	6	Aroldrin + Methylchloride + ACETONE	X	Ox1004	2	Cyanide	X	V82605L	
W-2-20171109	1/17/	0634		Water	9		X						
Tripl Blank				Water	1		X						
Relinquished by/date:	<i>✓</i> 1/19/17		Invoice Instructions - Univar to provide to Sampler (Circle code. If multiple codes apply, note in Remarks) <b>#041</b>										
Received by/date:	/		Soil Investigation/Remediation 035, 133 or 068, 156										
Relinquished by/date:	/		Water Investigation/Remediation 047, 148 or 165, 167										
Received by/date:	/		Air-Soil Investigation or Remediation 034 or 057										
Relinquished by/date:	/		Waste 171										
Received by/date:	/		SPECIAL INSTRUCTIONS & COMMENTS: Fax copy of lab results to Envir. Affairs Dept., 425/659-4126										
Relinquished by/date:	/		EMAIL RESULTS TO: <b>BRENDAN.ROBESON@ERM.COM</b> <b>DYLAN.STANKUS@ERM.COM</b>										
Received by/date:	/												
Relinquished by/date:	/												
Received by/date:	/												
Relinquished by/date:	/												
Received by/date:	/												
REPORT REQUIREMENTS: (check) <input checked="" type="checkbox"/> Routine Report <input type="checkbox"/> II. Report <input type="checkbox"/> III. Data Validation Report <input type="checkbox"/> IV. GLP Deliverable Report													
//Requested Report Date:													
TURNAROUND TIME: 24 hr 48 hr 8 day <input checked="" type="checkbox"/> Standard (7-10 working days) <input type="checkbox"/> Provide Verbal Prelim. Results <input type="checkbox"/> Fax Prelim. Results													

25

FA49256: Chain of Custody  
Page 1 of 2

# SGS Accutest Sample Receipt Summary

Job Number: FA49256	Client: ERM\Univar	Project: Univar - NW Yeon
Date / Time Received: 11/10/2017 9:45:00 AM	Delivery Method: FedEx	Airbill #'s: 811162161542
<b>Therm ID:</b> IR 1; <b>Therm CF:</b> 0.4; <b># of Coolers:</b> 1		
<b>Cooler Temps (Raw Measured) °C:</b> Cooler 1: (1.6); <b>Cooler Temps (Corrected) °C:</b> Cooler 1: (2.0);		

<b>Cooler Information</b>		<b>Y or N</b>	<b>Sample Information</b>	<b>Y or N</b>	<b>N/A</b>	
1. Custody Seals Present		<input checked="" type="checkbox"/> <input type="checkbox"/>	1. Sample labels present on bottles	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Custody Seals Intact		<input checked="" type="checkbox"/> <input type="checkbox"/>	2. Samples preserved properly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Temp criteria achieved		<input checked="" type="checkbox"/> <input type="checkbox"/>	3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Cooler temp verification		IR Gun	4. Condition of sample	Intact		
5. Cooler media		Ice (Bag)	5. Sample recvd within HT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Trip Blank Information</b>		<b>Y or N</b>	<b>N/A</b>	6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>	
1. Trip Blank present / cooler		<input checked="" type="checkbox"/> <input type="checkbox"/>	7. VOCs have headspace	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2. Trip Blank listed on COC		<input checked="" type="checkbox"/> <input type="checkbox"/>	8. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
		<b>W or S</b>	<b>N/A</b>	9. Compositing instructions clear	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Type Of TB Received		<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				11. % Solids Jar received?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
				12. Residual Chlorine Present?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Misc. Information</b>					
Number of Encores: 25-Gram	<input type="text"/>	5-Gram	<input type="text"/>	Number of 5035 Field Kits:	<input type="text"/>
Test Strip Lot #:	pH 0-3	230315		pH 10-12	219813A
Residual Chlorine Test Strip Lot #:			Number of Lab Filtered Metals: _____		
Comments			Other: (Specify) _____		

SM001  
Rev. Date 05/24/17

Technician: CORYR

Date: 11/10/2017 9:45:00 A

Reviewer: P.H

Date: 11/13/2017

**FA49256: Chain of Custody**

**Page 2 of 2**

**MS Volatiles****QC Data Summaries**

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 2

Job Number: FA49256  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1494-MB	I51449.D	1	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	Result	RL	MDL	Units	Q
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA49256  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1494-MB	I51449.D	1	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	Result	RL	MDL	Units	Q
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

### CAS No. Surrogate Recoveries Limits

1868-53-7	Dibromofluoromethane	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	104%	79-125%
2037-26-5	Toluene-D8	98%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

### CAS No. Tentatively Identified Compounds R.T. Est. Conc. Units Q

Total TIC, Volatile <sup>a</sup> 0 ug/l

(a) No TICs detected.

## Method Blank Summary

Page 1 of 1

**Job Number:** FA49256

**Account:** UNIVAR Univar

**Project:** ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1495-MB	I51475.D	1	11/15/17	AJ	n/a	n/a	VI1495

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

FA49256-1

6.1.2

CAS No.	Compound	Result	RL	MDL	Units	Q
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99%
17060-07-0	1,2-Dichloroethane-D4	105%
2037-26-5	Toluene-D8	97%
460-00-4	4-Bromofluorobenzene	100%

## Blank Spike Summary

Page 1 of 2

Job Number: FA49256  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1494-BS	I51448.D	1	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
107-02-8	Acrolein	125	129	103	31-154
107-13-1	Acrylonitrile	125	125	100	58-126
71-43-2	Benzene	25	25.4	102	81-122
75-27-4	Bromodichloromethane	25	27.0	108	79-123
75-25-2	Bromoform	25	24.3	97	66-123
75-15-0	Carbon Disulfide	25	27.6	110	66-148
56-23-5	Carbon Tetrachloride	25	28.1	112	76-136
108-90-7	Chlorobenzene	25	24.9	100	82-124
75-00-3	Chloroethane	25	36.1	144	62-144
110-75-8	2-Chloroethyl Vinyl Ether	125	124	99	56-122
67-66-3	Chloroform	25	26.0	104	80-124
124-48-1	Dibromochloromethane	25	26.5	106	78-122
75-71-8	Dichlorodifluoromethane	25	34.0	136	42-167
95-50-1	1,2-Dichlorobenzene	25	24.6	98	82-124
541-73-1	1,3-Dichlorobenzene	25	25.5	102	84-125
106-46-7	1,4-Dichlorobenzene	25	24.5	98	78-120
75-34-3	1,1-Dichloroethane	25	27.7	111	81-122
107-06-2	1,2-Dichloroethane	25	26.0	104	75-125
75-35-4	1,1-Dichloroethylene	25	27.6	110	78-137
156-59-2	cis-1,2-Dichloroethylene	25	26.2	105	78-120
156-60-5	trans-1,2-Dichloroethylene	25	27.3	109	76-127
78-87-5	1,2-Dichloropropane	25	25.2	101	76-124
10061-01-5	cis-1,3-Dichloropropene	25	24.6	98	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.4	98	80-120
100-41-4	Ethylbenzene	25	25.9	104	81-121
76-13-1	Freon 113	25	26.0	104	72-134
74-83-9	Methyl Bromide	25	26.8	107	59-143
74-87-3	Methyl Chloride	25	24.7	99	50-159
75-09-2	Methylene Chloride	25	24.7	99	69-135
100-42-5	Styrene	25	23.5	94	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	24.8	99	72-120
127-18-4	Tetrachloroethylene	25	26.3	105	76-135
108-88-3	Toluene	25	25.1	100	80-120
71-55-6	1,1,1-Trichloroethane	25	26.3	105	75-130
79-00-5	1,1,2-Trichloroethane	25	24.9	100	76-119
79-01-6	Trichloroethylene	25	26.7	107	81-126

\* = Outside of Control Limits.

6.2.1  
6

## Blank Spike Summary

Page 2 of 2

Job Number: FA49256  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1494-BS	I51448.D	1	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-69-4	Trichlorofluoromethane	25	30.3	121	71-156
75-01-4	Vinyl Chloride	25	30.7	123	69-159
	m,p-Xylene	50	52.3	105	79-126
95-47-6	o-Xylene	25	26.0	104	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	79-125%
2037-26-5	Toluene-D8	99%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 1

Job Number: FA49256  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1495-BS	I51474.D	1	11/15/17	AJ	n/a	n/a	VI1495

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-00-3	Chloroethane	25	36.9	148* a	62-144

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	83-118%
17060-07-0	1,2-Dichloroethane-D4	108%	79-125%
2037-26-5	Toluene-D8	100%	85-112%
460-00-4	4-Bromofluorobenzene	100%	83-118%

(a) Sporadic marginal failure.

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\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** FA49256  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48985-21MS	I51462.D	100	11/14/17	AJ	n/a	n/a	VI1494
FA48985-21MSD	I51463.D	100	11/14/17	AJ	n/a	n/a	VI1494
FA48985-21	I51450.D	100	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	FA48985-21		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
107-02-8	Acrolein	ND		12500	13400	107	12500	13700	110	2	31-154/29
107-13-1	Acrylonitrile	ND		12500	12900	103	12500	13400	107	4	58-126/16
71-43-2	Benzene	ND		2500	2520	101	2500	2540	102	1	81-122/14
75-27-4	Bromodichloromethane	ND		2500	2770	111	2500	2760	110	0	79-123/19
75-25-2	Bromoform	ND		2500	2390	96	2500	2380	95	0	66-123/21
75-15-0	Carbon Disulfide	ND		2500	2660	106	2500	2740	110	3	66-148/23
56-23-5	Carbon Tetrachloride	ND		2500	2970	119	2500	2950	118	1	76-136/23
108-90-7	Chlorobenzene	ND		2500	2460	98	2500	2490	100	1	82-124/14
75-00-3	Chloroethane	ND		2500	3620	145*	2500	3780	151*	4	62-144/20
110-75-8	2-Chloroethyl Vinyl Ether	ND		12500	11400	91	12500	10700	86	6	56-122/23
67-66-3	Chloroform	ND		2500	2680	107	2500	2690	108	0	80-124/15
124-48-1	Dibromochloromethane	ND		2500	2610	104	2500	2650	106	2	78-122/19
75-71-8	Dichlorodifluoromethane	ND		2500	3510	140	2500	3600	144	3	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		2500	2440	98	2500	2470	99	1	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		2500	2470	99	2500	2530	101	2	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		2500	2390	96	2500	2450	98	2	78-120/15
75-34-3	1,1-Dichloroethane	290		2500	3090	112	2500	3100	112	0	81-122/15
107-06-2	1,2-Dichloroethane	ND		2500	2820	113	2500	2770	111	2	75-125/14
75-35-4	1,1-Dichloroethylene	4830		2500	7760	117	2500	7580	110	2	78-137/18
156-59-2	cis-1,2-Dichloroethylene	ND		2500	2520	101	2500	2610	104	4	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		2500	2710	108	2500	2770	111	2	76-127/17
78-87-5	1,2-Dichloropropane	ND		2500	2450	98	2500	2520	101	3	76-124/14
10061-01-5	cis-1,3-Dichloropropene	ND		2500	2460	98	2500	2460	98	0	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		2500	2420	97	2500	2450	98	1	80-120/22
100-41-4	Ethylbenzene	ND		2500	2560	102	2500	2580	103	1	81-121/14
76-13-1	Freon 113	ND		2500	2670	107	2500	2710	108	1	72-134/20
74-83-9	Methyl Bromide	ND		2500	2740	110	2500	2900	116	6	59-143/19
74-87-3	Methyl Chloride	ND		2500	2420	97	2500	2570	103	6	50-159/19
75-09-2	Methylene Chloride	ND		2500	2560	102	2500	2600	104	2	69-135/16
100-42-5	Styrene	ND		2500	2320	93	2500	2340	94	1	78-119/23
79-34-5	1,1,2,2-Tetrachloroethane	ND		2500	2400	96	2500	2460	98	2	72-120/14
127-18-4	Tetrachloroethylene	247		2500	2850	104	2500	2850	104	0	76-135/16
108-88-3	Toluene	ND		2500	2460	98	2500	2480	99	1	80-120/14
71-55-6	1,1,1-Trichloroethane	47.4	J	2500	2800	110	2500	2800	110	0	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		2500	2460	98	2500	2460	98	0	76-119/14
79-01-6	Trichloroethylene	ND		2500	2720	109	2500	2710	108	0	81-126/15

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA49256  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA48985-21MS	I51462.D	100	11/14/17	AJ	n/a	n/a	VI1494
FA48985-21MSD	I51463.D	100	11/14/17	AJ	n/a	n/a	VI1494
FA48985-21	I51450.D	100	11/14/17	AJ	n/a	n/a	VI1494

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA49256-1, FA49256-2, FA49256-3

CAS No.	Compound	FA48985-21		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-69-4	Trichlorofluoromethane	ND		2500	3660	146	2500	3640	146	1	71-156/21
75-01-4	Vinyl Chloride	ND		2500	2880	115	2500	3220	129	11	69-159/18
	m,p-Xylene	ND		5000	5300	106	5000	5330	107	1	79-126/15
95-47-6	o-Xylene	ND		2500	2560	102	2500	2600	104	2	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA48985-21 Limits
1868-53-7	Dibromofluoromethane	106%	105%	100% 83-118%
17060-07-0	1,2-Dichloroethane-D4	118%	114%	107% 79-125%
2037-26-5	Toluene-D8	97%	98%	97% 85-112%
460-00-4	4-Bromofluorobenzene	98%	98%	100% 83-118%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA49256

Account: UNIVAR Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA49280-13MS	I51487.D	5	11/15/17	AJ	n/a	n/a	VI1495
FA49280-13MSD	I51488.D	5	11/15/17	AJ	n/a	n/a	VI1495
FA49280-13 a	I51484.D	5	11/15/17	AJ	n/a	n/a	VI1495

The QC reported here applies to the following samples:

Method: SW846 8260B

FA49256-1

CAS No.	Compound	FA49280-13		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-00-3	Chloroethane	66.5		125	272	164*	125	357	232*	27*	62-144/20
CAS No.	Surrogate Recoveries	MS	MSD	FA49280-13 Limits							
1868-53-7	Dibromofluoromethane	106%	105%	104%	83-118%						
17060-07-0	1,2-Dichloroethane-D4	116%	114%	114%	79-125%						
2037-26-5	Toluene-D8	97%	97%	97%	85-112%						
460-00-4	4-Bromofluorobenzene	98%	98%	98%	83-118%						

(a) Dilution required due to matrix interference (sample foamed).

\* = Outside of Control Limits.

6.3.2  
6

**General Chemistry****QC Data Summaries**

7

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA49256  
Account: UNIVAR - Univar  
Project: ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Cyanide, Total	GP30617/GN76943	0.010	0.0	mg/l	0.1	0.105	105.0	90-110%
HEM Oil and Grease	GP30746/GN77146	5.0	0.0	mg/l	40.0	34.1	85.3	78-114%

Associated Samples:

Batch GP30617: FA49256-2  
Batch GP30746: FA49256-2  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA49256  
Account: UNIVAR - Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Cyanide, Total	GP30617/GN76943	FA49199-1	mg/l	0.0046	0.1	0.098	93.4	90-110%
HEM Oil and Grease	GP30746/GN77146	FA49245-2	mg/l	5.8	40.0	25.4	50.2*(a)	78-114%

Associated Samples:

Batch GP30617: FA49256-2

Batch GP30746: FA49256-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA49256  
Account: UNIVAR - Univar  
Project: ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Cyanide, Total	GP30617/GN76943	FA49199-1	mg/l	0.0046	0.1	0.098	0.0	20%

Associated Samples:

Batch GP30617: FA49256-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

7.3

7

# Memorandum

Environmental  
Resources  
Management

**To:** Tanya Battye

**From:** Jack James

**Date:** 06 November 2017

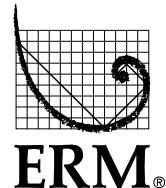
**Subject:** Data Review of Univar NW Yeon Water Treatment System Samples Collected 09 November 2017

**Project Number:** 0436528

---

**Data Packages:** SGS Accutest Data Package FA49256

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)  
[www.erm.com](http://www.erm.com)



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017 and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017.

## ***HOLDING TIME AND PRESERVATION EVALUATION***

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C. The laboratory noted that samples W-1-20171109, W-2-20171109, and TRIP BLANK were not preserved to a pH of less than 2 for method 8260B. All three samples were analyzed within the shortened holding time of 7 days for unpreserved samples and qualifications were not necessary. Data associated with exceeded preservation requirements are listed in Table 1. Remaining samples were acceptably preserved and were prepared and analyzed within the method-prescribed time period from the date of collection.

## ***BLANK EVALUATION***

The method and trip blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory or during shipment, handling, and storage.

## ***CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION***

The continuing calibration verification (CCV) recoveries were within the laboratory's limits of acceptance, with limited exceptions. The CCV in batch VI1494 recovery exceeded the method 8260B laboratory limits for Carbon Tetrachloride. Carbon tetrachloride was not detected in the associated samples and qualifications were not necessary due to the high CCV recovery. The CCV outlier is presented in Table 2.

## ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance, with the exception noted below. An LCS sample recovery was above the control limit for chloroethane. The associated sample result was qualified as estimated with a high bias (J+) due to the high LCS recovery. The outlier and associated qualification can be found in Table 3.

## ***MATRIX SPIKE EVALUATION***

The matrix spike (MS)/matrix spike duplicate (MSD) recoveries and RPDs were within laboratory limits of acceptance with several exceptions. No data were qualified as all outliers are from non-project samples. The outliers can be found in Table 3.

## ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

## ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

## ***OVERALL ASSESSMENT***

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

**Table 1**  
*Samples with Exceeded Preservation Requirements*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in November 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Analysis Method	Preservation Condition	Limits	ERM Qualifier
FA49256	W-1-20171109	8260B	pH > 2	pH < 2	--
	W-2-20171109				
	TRIP BLANK				

Lab report reviewed: FA49256

**Table 2**  
*Calibration Verification Recoveries Outside of Acceptable Limits*  
*Water Treatment Samples Collected at Univar NW Yeon Facility in November 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Associated Sample	Compound	CCV Recovery	Reported Concentration	Units	ERM Qualifier
FA49256	CCV in batch VI1494	--	Carbon Tetrachloride	High	NR	%	--

Lab report reviewed: FA49256

**Key:**

CCV = Continuing calibration verification

High = CCV above maximum acceptable limit

NR = Not reported

**Table 3**  
*Spike Recoveries Outside of Acceptable Limits*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in November 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
<b>LCS/LCSD</b>										
FA49256	LCS VI1495	See below	Chloroethane	148	62-144	NC	--	--	--	--
	--	W-1-20171109	Chloroethane	--	--	--	--	90.1	µg/L	J+
<b>MS/MSD</b>										
FA49256	Batch QC	--	Chloroethane	145/151	62-144	4	20	ND	µg/L	--
	Batch QC	--	Chloroethane	164/232	62-144	27	20	66.5	µg/L	--
	Batch QC	--	HEM Oil and Grease	50.2	78-114	NC	--	5.8	mg/L	--

Lab report reviewed: FA49256

**Key:**

Batch = Spike sample was prepared using non-client sample

HEM = Hexane extractable material

LCS/LCSD = Laboratory control sample/laboratory control sample duplicate

MS/MSD - Matrix spike/matrix spike duplicate

µg/L = Micrograms per liter

mg/L = Milligrams per liter

NC = Not calculated

RPD = Relative percent difference

The results set forth herein are provided by SGS North America Inc.

**e-Hardcopy 2.0**  
*Automated Report*

Technical Report for

Univar

ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

S074

SGS Job Number: FA50344

Sampling Dates: 12/13/17 - 12/15/17



Report to:

ERM  
1001 SW 5th Ave Suite 1010  
Portland, OR 97204  
Brendan.Robinson@erm.com; Dylan.Stankus@erm.com;  
tanya.battye@erm.com  
ATTN: Brendan Robinson

Total number of pages in report: **186**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Elvin Kumar 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(L-A-B L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, GA, IA, KY, MA, NV, OK, OR, UT, WA

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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>6</b>
<b>Section 3: Summary of Hits .....</b>	<b>9</b>
<b>Section 4: Sample Results .....</b>	<b>16</b>
<b>4.1: FA50344-1: TRIP-1 .....</b>	17
<b>4.2: FA50344-2: SMW-11-20171213 .....</b>	20
<b>4.3: FA50344-3: PZ-06-20171213 .....</b>	24
<b>4.4: FA50344-4: SMW-03-20171213 .....</b>	28
<b>4.5: FA50344-5: SMW-40-20171213 .....</b>	31
<b>4.6: FA50344-6: DMW-08-20171213 .....</b>	34
<b>4.7: FA50344-7: SMW-21-20171213 .....</b>	37
<b>4.8: FA50344-8: FB-01-20171213 .....</b>	40
<b>4.9: FA50344-9: SMW-09-20171213 .....</b>	43
<b>4.10: FA50344-10: SMW-26-20171213 .....</b>	46
<b>4.11: FA50344-11: SMW-12-20171213 .....</b>	50
<b>4.12: FA50344-12: SMW-12-20171213-D1 .....</b>	53
<b>4.13: FA50344-13: SMW-04-20171213 .....</b>	56
<b>4.14: FA50344-14: SMW-06-20171213 .....</b>	59
<b>4.15: FA50344-15: SMW-07-20171213 .....</b>	63
<b>4.16: FA50344-16: PZ-08-20171214 .....</b>	65
<b>4.17: FA50344-17: PZ-07-20171214 .....</b>	67
<b>4.18: FA50344-18: PZ-04-20171214 .....</b>	69
<b>4.19: FA50344-19: SMW-38-20171214 .....</b>	72
<b>4.20: FA50344-20: SMW-37-20171214 .....</b>	76
<b>4.21: FA50344-21: SMW-39-20171214 .....</b>	80
<b>4.22: FA50344-22: SMW-30-20171214 .....</b>	83
<b>4.23: FA50344-23: SMW-22-20171214 .....</b>	86
<b>4.24: FA50344-24: FB-02-20171214 .....</b>	88
<b>4.25: FA50344-25: EXW-3A-20171214 .....</b>	90
<b>4.26: FA50344-26: EXW-3A-20171214-D2 .....</b>	93
<b>4.27: FA50344-27: EXW-02-20171215-D3 .....</b>	95
<b>4.28: FA50344-28: FB-03-20171215 .....</b>	97
<b>4.29: FA50344-29: EXW-02-20171215 .....</b>	99
<b>4.30: FA50344-30: PZ-12-20171215 .....</b>	102
<b>4.31: FA50344-31: PZ-11-20171215 .....</b>	105
<b>4.32: FA50344-32: SMW-08-20171215 .....</b>	108
<b>Section 5: Misc. Forms .....</b>	<b>111</b>
<b>5.1: Chain of Custody .....</b>	112
<b>Section 6: MS Volatiles - QC Data Summaries .....</b>	<b>116</b>
<b>6.1: Method Blank Summary .....</b>	117
<b>6.2: Blank Spike Summary .....</b>	139
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	160

## Sample Summary

Univar

**Job No:** FA50344

ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA50344-1	12/13/17	00:00 ST	12/16/17	AQ Trip Blank Water	TRIP-1
FA50344-2	12/13/17	07:38 ST	12/16/17	AQ Ground Water	SMW-11-20171213
FA50344-3	12/13/17	08:21 ST	12/16/17	AQ Ground Water	PZ-06-20171213
FA50344-4	12/13/17	09:18 ST	12/16/17	AQ Ground Water	SMW-03-20171213
FA50344-5	12/13/17	10:01 ST	12/16/17	AQ Ground Water	SMW-40-20171213
FA50344-6	12/13/17	10:04 ST	12/16/17	AQ Ground Water	DMW-08-20171213
FA50344-7	12/13/17	10:56 ST	12/16/17	AQ Ground Water	SMW-21-20171213
FA50344-8	12/13/17	11:12 ST	12/16/17	AQ Field Blank Water	FB-01-20171213
FA50344-9	12/13/17	11:32 ST	12/16/17	AQ Ground Water	SMW-09-20171213
FA50344-10	12/13/17	12:07 ST	12/16/17	AQ Ground Water	SMW-26-20171213
FA50344-11	12/13/17	12:37 ST	12/16/17	AQ Ground Water	SMW-12-20171213
FA50344-12	12/13/17	12:37 ST	12/16/17	AQ Ground Water	SMW-12-20171213-D1
FA50344-13	12/13/17	13:17 ST	12/16/17	AQ Ground Water	SMW-04-20171213

## Sample Summary

(continued)

Univar

**Job No:** FA50344

ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA50344-14	12/13/17	13:50 ST	12/16/17	AQ	Ground Water
FA50344-15	12/13/17	14:28 ST	12/16/17	AQ	Ground Water
FA50344-16	12/14/17	07:39 ST	12/16/17	AQ	Ground Water
FA50344-17	12/14/17	08:10 ST	12/16/17	AQ	Ground Water
FA50344-18	12/14/17	08:59 ST	12/16/17	AQ	Ground Water
FA50344-19	12/14/17	09:29 ST	12/16/17	AQ	Ground Water
FA50344-20	12/14/17	09:58 ST	12/16/17	AQ	Ground Water
FA50344-21	12/14/17	10:37 ST	12/16/17	AQ	Ground Water
FA50344-22	12/14/17	12:02 ST	12/16/17	AQ	Ground Water
FA50344-23	12/14/17	12:46 ST	12/16/17	AQ	Ground Water
FA50344-24	12/14/17	13:20 ST	12/16/17	AQ	Field Blank Water
FA50344-25	12/14/17	13:43 ST	12/16/17	AQ	Ground Water
FA50344-26	12/14/17	13:43 ST	12/16/17	AQ	Ground Water

**Sample Summary**

(continued)

Univar

**Job No:** FA50344ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA50344-27	12/15/17	08:21 ST	12/16/17	AQ	Ground Water
FA50344-28	12/15/17	07:50 ST	12/16/17	AQ	Field Blank Water
FA50344-29	12/15/17	08:21 ST	12/16/17	AQ	Ground Water
FA50344-30	12/15/17	09:09 ST	12/16/17	AQ	Ground Water
FA50344-31	12/15/17	09:36 ST	12/16/17	AQ	Ground Water
FA50344-32	12/15/17	10:10 ST	12/16/17	AQ	Ground Water
					SMW-08-20171215

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Univar

**Job** FA50344

**Site:** ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue,

**Report** 1/10/2018 10:54:10

28 Samples, 1 Trip Blank and 3 Field Blank were collected on/between 12/13/2017 and 12/15/2017 and were received at SGS Accutest Southeast (SASE) on 12/16/2017 properly preserved, at 1.2 Deg. C and intact. These Samples received an SASE job number of FA50344. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VI1526

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50344-10MS, FA50344-10MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for 1,1-Dichloroethane, 1,1-Dichloroethylene, Chloroethane, cis-1,2-Dichloroethylene, Vinyl Chloride are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

Matrix Spike Duplicate Recovery(s) for 1,1-Dichloroethane, 1,1-Dichloroethylene, cis-1,2-Dichloroethylene, Trichloroethylene, Vinyl Chloride are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

FA50344-6 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-6 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

FA50344-7 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-8 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-8 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

FA50344-9 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-9 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

FA50344-10 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-10 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

FA50344-11 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-11 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

FA50344-12 for 2-Hexanone: Associated CCV outside of control limits high, sample was ND.

FA50344-12 for Chloroethane: Associated CCV outside of control limits high, sample was ND.

**Matrix:** AQ

**Batch ID:** VI1530

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50344-19MS, FA50344-19MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for Vinyl Chloride are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

Matrix Spike Recovery(s) for cis-1,2-Dichloroethylene, Tetrachloroethylene, Toluene, Trichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike Duplicate Recovery(s) for 1,1-Dichloroethane, cis-1,2-Dichloroethylene, cis-1,3-Dichloropropene, Ethylbenzene, Styrene, Tetrachloroethylene, Toluene, Trichloroethylene, Vinyl Chloride are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

FA50344-19 for Methyl Chloride: Associated CCV outside of control limits high, sample was ND.

**Matrix:** AQ

**Batch ID:** VJ5783

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50455-6MS, FA50455-6MSD were used as the QC samples indicated.

## MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VJ5785

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50492-1MS, FA50492-1MSD were used as the QC samples indicated.

Matrix Spike / Matrix Spike Duplicate Recovery(s) for Bromoform, cis-1,3-Dichloropropene, trans-1,3-Dichloropropene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

**Matrix:** AQ

**Batch ID:** VJ5787

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50305-2MS, FA50305-2MSD were used as the QC samples indicated.

FA50344-32: Confirmation run.

**Matrix:** AQ

**Batch ID:** VJ5789

All method blanks for this batch meet method specific criteria.

Sample(s) FA50382-3MS, FA50382-3MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA50344-19. Sample re-analyzed beyond hold time; reported results are considered minimum values for 1,1,1-Trichloroethane.

**Matrix:** AQ

**Batch ID:** VM4322

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50381-3MS, FA50381-3MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for Chloroethane are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

Matrix Spike Duplicate Recovery(s) for 1,3-Dichloropropane are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

RPD(s) for MSD for 1,2,3-Trichloropropane, 1,4-Dichlorobenzene are outside control limits for sample FA50381-3MSD. Probable cause is due to sample non-homogeneity.

FA50344-13 for Acetone: Associated CCV outside of control limits high, sample was ND.

FA50344-14 for Acetone: Associated CCV outside of control limits high, sample was ND.

**Matrix:** AQ

**Batch ID:** VM4328

All method blanks for this batch meet method specific criteria.

Sample(s) FA50305-2MS, FA50305-2MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA50344-32. Sample re-analyzed beyond hold time; reported results are considered minimum values.

Matrix Spike / Matrix Spike Duplicate Recovery(s) for trans-1,3-Dichloropropene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

**Matrix:** AQ

**Batch ID:** VP2071

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50381-4MS, FA50381-4MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for Dichlorodifluoromethane, Hexachlorobutadiene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

RPD(s) for MSD for Dichlorodifluoromethane are outside control limits for sample FA50381-4MSD. Probable cause is due to sample non-homogeneity.

FA50344-1 for Hexachlorobutadiene: Associated CCV outside of control limits low.

FA50344-2 for Hexachlorobutadiene: Associated CCV outside of control limits low.

FA50344-3 for Hexachlorobutadiene: Associated CCV outside of control limits low.

FA50344-4 for Hexachlorobutadiene: Associated CCV outside of control limits low.

FA50344-5 for Hexachlorobutadiene: Associated CCV outside of control limits low.

**Matrix:** AQ

**Batch ID:** VP2077

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50426-7MS, FA50426-7MSD were used as the QC samples indicated.

## MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VP2078

All method blanks for this batch meet method specific criteria.

Sample(s) FA50523-21MS, FA50523-21MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA50344-30. Sample contained significant headspace. Sample re-analyzed beyond hold time; reported results are considered minimum values for Toluene.

Matrix Spike Recovery(s) for Toluene are outside control limits. Probable cause is due to matrix interference. For method performance in a clean matrix, refer to Blank Spike.

RPD(s) for MSD for Toluene are outside control limits for sample FA50523-21MSD. Probable cause is due to sample non-homogeneity.

**Matrix:** AQ

**Batch ID:** VP2083

All method blanks for this batch meet method specific criteria.

Sample(s) FA50582-2MS, FA50582-2MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA50344-6, FA50344-7.

FA50344-6: Sample re-analyzed beyond hold time; reported results are considered minimum values for cis-1,2-Dichloroethylene, 1,2-Dichloroethene (total).

FA50344-7: Sample re-analyzed beyond hold time; reported results are considered minimum values for Chloroethane.

## MS Volatiles By Method SW846 8260B BY SIM

**Matrix:** AQ

**Batch ID:** VZ1876

All method blanks for this batch meet method specific criteria.

Sample(s) FA50545-1MS, FA50545-1MSD were used as the QC samples indicated.

Sample(s) FA50344-19 have surrogates outside control limits. Probable cause is due to matrix interference.

FA50344-19 for Toluene-D8: Outside control limits due to matrix interference.

The following samples were run outside of holding time for method SW846 8260B BY SIM: FA50344-2, FA50344-3, FA50344-10, FA50344-14, FA50344-19, FA50344-20, FA50344-25. Samples re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

SGS Accutest (SASE) certifies that this report meets the project requirements for analytical data produced for the samples as received at SASE and as stated on the COC. SASE certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SASE Quality Manual except as noted above. This report is to be used in its entirety. SASE is not responsible for any assumptions of data quality if partial data packages are used

Narrative prepared by:

Lovelie Metzgar, QA Officer (signature on file)

Date: January 10, 2018

**Summary of Hits**

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

Lab Sample ID Analyte	Client Sample ID Qual	Result/ RL	MDL	Units	Method
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**FA50344-1 TRIP-1**

No hits reported in this sample.

**FA50344-2 SMW-11-20171213**

1,4-Dioxane a	61.4	1.0	ug/l	SW846 8260B BY SIM
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**FA50344-3 PZ-06-20171213**

Benzene	18.6	10	ug/l	SW846 8260B
Chloroethane	476	20	ug/l	SW846 8260B
1,1-Dichloroethane	17.1	10	ug/l	SW846 8260B
Toluene	794	10	ug/l	SW846 8260B
1,4-Dioxane a	1250	20	ug/l	SW846 8260B BY SIM

**FA50344-4 SMW-03-20171213**

1,1-Dichloroethane	11.0	2.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	107	2.0	ug/l	SW846 8260B
trans-1,2-Dichloroethylene	4.5	2.0	ug/l	SW846 8260B
Trichloroethylene	17.0	2.0	ug/l	SW846 8260B

**FA50344-5 SMW-40-20171213**

Benzene	209	50	ug/l	SW846 8260B
1,2-Dichlorobenzene	95.5	50	ug/l	SW846 8260B
1,1-Dichloroethane	1190	50	ug/l	SW846 8260B
1,1-Dichloroethylene	84.7	50	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	3060	50	ug/l	SW846 8260B
Ethylbenzene	86.7	50	ug/l	SW846 8260B
Toluene	111	50	ug/l	SW846 8260B
Trichloroethylene	159	50	ug/l	SW846 8260B
Vinyl Chloride	966	50	ug/l	SW846 8260B

**FA50344-6 DMW-08-20171213**

1,1-Dichloroethane	15.1	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	1.6	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene b	89.4	5.0	ug/l	SW846 8260B
1,2-Dichloroethene (total) b	89.4	10	ug/l	SW846 8260B
Tetrachloroethylene	2.0	1.0	ug/l	SW846 8260B
Toluene	2.6	1.0	ug/l	SW846 8260B
Trichloroethylene	7.6	1.0	ug/l	SW846 8260B
Vinyl Chloride	65.6	1.0	ug/l	SW846 8260B

## Summary of Hits

Page 2 of 7

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### FA50344-7 SMW-21-20171213

Benzene	8.4	1.0	ug/l	SW846 8260B
Vinyl Chloride	3.0	1.0	ug/l	SW846 8260B

### FA50344-8 FB-01-20171213

No hits reported in this sample.

### FA50344-9 SMW-09-20171213

1,1-Dichloroethane	121	25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	121	25	ug/l	SW846 8260B
Vinyl Chloride	1170	25	ug/l	SW846 8260B

### FA50344-10 SMW-26-20171213

1,1-Dichloroethane	129	25	ug/l	SW846 8260B
1,1-Dichloroethylene	199	25	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	1310	25	ug/l	SW846 8260B
Trichloroethylene	106	25	ug/l	SW846 8260B
Vinyl Chloride	854	25	ug/l	SW846 8260B
1,4-Dioxane <sup>a</sup>	31.5	1.0	ug/l	SW846 8260B BY SIM

### FA50344-11 SMW-12-20171213

cis-1,2-Dichloroethylene	22.7	1.0	ug/l	SW846 8260B
Trichloroethylene	3.8	1.0	ug/l	SW846 8260B
Vinyl Chloride	9.9	1.0	ug/l	SW846 8260B

### FA50344-12 SMW-12-20171213-D1

cis-1,2-Dichloroethylene	22.8	1.0	ug/l	SW846 8260B
Trichloroethylene	4.1	1.0	ug/l	SW846 8260B
Vinyl Chloride	10.1	1.0	ug/l	SW846 8260B

### FA50344-13 SMW-04-20171213

Chloroethane	2.1	2.0	ug/l	SW846 8260B
1,1-Dichloroethane	6.1	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	3.2	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	20.8	1.0	ug/l	SW846 8260B
Tetrachloroethylene	173	5.0	ug/l	SW846 8260B
1,1,1-Trichloroethane	19.5	1.0	ug/l	SW846 8260B

## Summary of Hits

Page 3 of 7

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

3

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

Trichloroethylene	71.1	1.0	ug/l	SW846 8260B
Vinyl Chloride	32.6	1.0	ug/l	SW846 8260B

### FA50344-14 SMW-06-20171213

Chloroform	3.5	1.0	ug/l	SW846 8260B
1,1-Dichloroethane	5.7	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	207	5.0	ug/l	SW846 8260B
trans-1,2-Dichloroethylene	2.8	1.0	ug/l	SW846 8260B
Tetrachloroethylene	169	5.0	ug/l	SW846 8260B
1,1,1-Trichloroethane	32.7	1.0	ug/l	SW846 8260B
Trichloroethylene	146	5.0	ug/l	SW846 8260B
1,4-Dioxane <sup>a</sup>	1.8	1.0	ug/l	SW846 8260B BY SIM

### FA50344-15 SMW-07-20171213

1,1-Dichloroethane	1530	1000	ug/l	SW846 8260B
1,1-Dichloroethylene	1460	1000	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	19600	1000	ug/l	SW846 8260B
Ethylbenzene	5490	1000	ug/l	SW846 8260B
Tetrachloroethylene	22000	1000	ug/l	SW846 8260B
Toluene	80600	1000	ug/l	SW846 8260B
1,1,1-Trichloroethane	8370	1000	ug/l	SW846 8260B
Trichloroethylene	22200	1000	ug/l	SW846 8260B
m,p-Xylene	15500	2000	ug/l	SW846 8260B
o-Xylene	5120	1000	ug/l	SW846 8260B

### FA50344-16 PZ-08-20171214

cis-1,2-Dichloroethylene	42.2	1.0	ug/l	SW846 8260B
Trichloroethylene	1.4	1.0	ug/l	SW846 8260B
Vinyl Chloride	12.5	1.0	ug/l	SW846 8260B

### FA50344-17 PZ-07-20171214

1,1-Dichloroethane	1.9	1.0	ug/l	SW846 8260B
1,1-Dichloroethylene	1.6	1.0	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	67.8	1.0	ug/l	SW846 8260B
trans-1,2-Dichloroethylene	1.6	1.0	ug/l	SW846 8260B
Trichloroethylene	8.9	1.0	ug/l	SW846 8260B
Vinyl Chloride	14.4	1.0	ug/l	SW846 8260B

### FA50344-18 PZ-04-20171214

Benzene	27.5	5.0	ug/l	SW846 8260B
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**Summary of Hits**

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Chloroethane		780	40		ug/l	SW846 8260B
1,2-Dichlorobenzene		5.8	5.0		ug/l	SW846 8260B
1,1-Dichloroethane		87.3	5.0		ug/l	SW846 8260B
Ethylbenzene		923	20		ug/l	SW846 8260B
Isopropylbenzene		9.7	5.0		ug/l	SW846 8260B
n-Propylbenzene		14.4	5.0		ug/l	SW846 8260B
Toluene		183	5.0		ug/l	SW846 8260B
1,1,1-Trichloroethane		7.4	5.0		ug/l	SW846 8260B
1,2,4-Trimethylbenzene		75.4	5.0		ug/l	SW846 8260B
1,3,5-Trimethylbenzene		12.4	5.0		ug/l	SW846 8260B
m,p-Xylene		1470	40		ug/l	SW846 8260B
o-Xylene		276	20		ug/l	SW846 8260B

**FA50344-19      SMW-38-20171214**

Benzene	70.3	50		ug/l	SW846 8260B
1,2-Dichlorobenzene	63.3	50		ug/l	SW846 8260B
1,1-Dichloroethane	1290	50		ug/l	SW846 8260B
1,1-Dichloroethylene	752	50		ug/l	SW846 8260B
cis-1,2-Dichloroethylene	6430	100		ug/l	SW846 8260B
Ethylbenzene	779	50		ug/l	SW846 8260B
Methylene Chloride	413	250		ug/l	SW846 8260B
4-Methyl-2-pentanone (MIBK)	348	250		ug/l	SW846 8260B
Styrene	81.8	50		ug/l	SW846 8260B
Tetrachloroethylene	2580	50		ug/l	SW846 8260B
Toluene	4390	50		ug/l	SW846 8260B
1,1,1-Trichloroethane <sup>b</sup>	26600	500		ug/l	SW846 8260B
Trichloroethylene	4060	50		ug/l	SW846 8260B
1,2,4-Trimethylbenzene	244	50		ug/l	SW846 8260B
1,3,5-Trimethylbenzene	99.9	50		ug/l	SW846 8260B
Vinyl Chloride	1990	50		ug/l	SW846 8260B
m,p-Xylene	1470	100		ug/l	SW846 8260B
o-Xylene	560	50		ug/l	SW846 8260B
1,4-Dioxane <sup>a</sup>	88.0	5.0		ug/l	SW846 8260B BY SIM

**FA50344-20      SMW-37-20171214**

cis-1,2-Dichloroethylene	22700	500		ug/l	SW846 8260B
Tetrachloroethylene	8320	200		ug/l	SW846 8260B
Trichloroethylene	3460	200		ug/l	SW846 8260B
1,4-Dioxane <sup>c</sup>	6.8	1.0		ug/l	SW846 8260B BY SIM

**FA50344-21      SMW-39-20171214**

1,2-Dichlorobenzene	137	100		ug/l	SW846 8260B
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## Summary of Hits

Page 5 of 7

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
1,1-Dichloroethylene	324	100			ug/l	SW846 8260B
cis-1,2-Dichloroethylene	4440	100			ug/l	SW846 8260B
Tetrachloroethylene	24400	500			ug/l	SW846 8260B
1,1,1-Trichloroethane	1530	100			ug/l	SW846 8260B
Trichloroethylene	20800	500			ug/l	SW846 8260B

### FA50344-22 SMW-30-20171214

n-Butylbenzene	16.9	2.0			ug/l	SW846 8260B
sec-Butylbenzene	16.4	2.0			ug/l	SW846 8260B
1,1-Dichloroethane	4.3	2.0			ug/l	SW846 8260B
cis-1,2-Dichloroethylene	28.0	2.0			ug/l	SW846 8260B
Ethylbenzene	148	2.0			ug/l	SW846 8260B
Isopropylbenzene	52.6	2.0			ug/l	SW846 8260B
p-Isopropyltoluene	8.1	2.0			ug/l	SW846 8260B
Naphthalene	491	50			ug/l	SW846 8260B
n-Propylbenzene	106	2.0			ug/l	SW846 8260B
Toluene	18.5	2.0			ug/l	SW846 8260B
Trichloroethylene	7.0	2.0			ug/l	SW846 8260B
1,2,4-Trimethylbenzene	566	10			ug/l	SW846 8260B
1,3,5-Trimethylbenzene	50.9	2.0			ug/l	SW846 8260B
Vinyl Chloride	16.1	2.0			ug/l	SW846 8260B
m,p-Xylene	57.3	4.0			ug/l	SW846 8260B
o-Xylene	6.8	2.0			ug/l	SW846 8260B

### FA50344-23 SMW-22-20171214

Chloroethane	19.6	2.0			ug/l	SW846 8260B
1,1-Dichloroethane	12.5	1.0			ug/l	SW846 8260B
1,1-Dichloroethylene	1.2	1.0			ug/l	SW846 8260B
cis-1,2-Dichloroethylene	66.2	1.0			ug/l	SW846 8260B
Ethylbenzene	36.3	1.0			ug/l	SW846 8260B
Toluene	7.7	1.0			ug/l	SW846 8260B
1,1,1-Trichloroethane	4.4	1.0			ug/l	SW846 8260B
1,2,4-Trimethylbenzene	1.4	1.0			ug/l	SW846 8260B
Vinyl Chloride	49.4	1.0			ug/l	SW846 8260B
m,p-Xylene	30.8	2.0			ug/l	SW846 8260B
o-Xylene	10.4	1.0			ug/l	SW846 8260B

### FA50344-24 FB-02-20171214

No hits reported in this sample.

## Summary of Hits

Page 6 of 7

Job Number: FA50344

Account: Univar

Project: ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### FA50344-25 EXW-3A-20171214

cis-1,2-Dichloroethylene	3.6	1.0	ug/l	SW846 8260B
1,4-Dioxane <sup>a</sup>	1.2	1.0	ug/l	SW846 8260B BY SIM

### FA50344-26 EXW-3A-20171214-D2

cis-1,2-Dichloroethylene	3.6	1.0	ug/l	SW846 8260B
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### FA50344-27 EXW-02-20171215-D3

Benzene	3.2	2.5	ug/l	SW846 8260B
Chloroethane	14.5	5.0	ug/l	SW846 8260B
1,2-Dichlorobenzene	2.8	2.5	ug/l	SW846 8260B
1,1-Dichloroethane	20.8	2.5	ug/l	SW846 8260B
1,1-Dichloroethylene	12.2	2.5	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	183	2.5	ug/l	SW846 8260B
1,1,1-Trichloroethane	5.3	2.5	ug/l	SW846 8260B
Trichloroethylene	3.9	2.5	ug/l	SW846 8260B
Vinyl Chloride	33.9	2.5	ug/l	SW846 8260B
o-Xylene	3.5	2.5	ug/l	SW846 8260B

### FA50344-28 FB-03-20171215

No hits reported in this sample.

### FA50344-29 EXW-02-20171215

Benzene	3.0	2.5	ug/l	SW846 8260B
Chloroethane	14.9	5.0	ug/l	SW846 8260B
1,2-Dichlorobenzene	2.9	2.5	ug/l	SW846 8260B
1,1-Dichloroethane	21.3	2.5	ug/l	SW846 8260B
1,1-Dichloroethylene	12.5	2.5	ug/l	SW846 8260B
cis-1,2-Dichloroethylene	179	2.5	ug/l	SW846 8260B
1,1,1-Trichloroethane	4.9	2.5	ug/l	SW846 8260B
Trichloroethylene	4.0	2.5	ug/l	SW846 8260B
Vinyl Chloride	34.2	2.5	ug/l	SW846 8260B
o-Xylene	3.5	2.5	ug/l	SW846 8260B
1,4-Dioxane	19.6	1.0	ug/l	SW846 8260B BY SIM

### FA50344-30 PZ-12-20171215

Benzene	235	200	ug/l	SW846 8260B
Chloroethane	1620	400	ug/l	SW846 8260B
1,1-Dichloroethane	3300	200	ug/l	SW846 8260B

## Summary of Hits

Page 7 of 7

Job Number: FA50344

Account: Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Collected: 12/13/17 thru 12/15/17

3

Lab Sample ID Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
1,1-Dichloroethylene	997	200			ug/l	SW846 8260B
cis-1,2-Dichloroethylene	40400	1000			ug/l	SW846 8260B
Ethylbenzene	5930	200			ug/l	SW846 8260B
Toluene <sup>d</sup>	91700	5000			ug/l	SW846 8260B
1,1,1-Trichloroethane	1270	200			ug/l	SW846 8260B
Trichloroethylene	306	200			ug/l	SW846 8260B
1,2,4-Trimethylbenzene	254	200			ug/l	SW846 8260B
Vinyl Chloride	3310	200			ug/l	SW846 8260B
m,p-Xylene	12000	400			ug/l	SW846 8260B
o-Xylene	3480	200			ug/l	SW846 8260B

**FA50344-31 PZ-11-20171215**

1,1-Dichloroethane	1260	500		ug/l	SW846 8260B
1,1-Dichloroethylene	1300	500		ug/l	SW846 8260B
cis-1,2-Dichloroethylene	39800	500		ug/l	SW846 8260B
Ethylbenzene	5150	500		ug/l	SW846 8260B
Styrene	550	500		ug/l	SW846 8260B
Toluene	69300	1000		ug/l	SW846 8260B
1,1,1-Trichloroethane	3170	500		ug/l	SW846 8260B
Vinyl Chloride	2420	500		ug/l	SW846 8260B
m,p-Xylene	10400	1000		ug/l	SW846 8260B
o-Xylene	2770	500		ug/l	SW846 8260B

**FA50344-32 SMW-08-20171215**

1,1-Dichloroethane <sup>b</sup>	1.6	1.0		ug/l	SW846 8260B
cis-1,2-Dichloroethylene <sup>b</sup>	4.4	1.0		ug/l	SW846 8260B
Tetrachloroethylene <sup>b</sup>	2.2	1.0		ug/l	SW846 8260B
Trichloroethylene <sup>b</sup>	1.2	1.0		ug/l	SW846 8260B

- (a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.
- (b) Sample re-analyzed beyond hold time; reported results are considered minimum values.
- (c) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values. Associated internal standard response outside control limits.
- (d) Sample contained significant headspace. Sample re-analyzed beyond hold time; reported results are considered minimum values.

## Sample Results

Report of Analysis

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**Report of Analysis**

Page 1 of 3

<b>Client Sample ID:</b>	TRIP-1	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-1	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	P54583.D	1	12/22/17 18:52	AJ	n/a	n/a	VP2071
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.1

4

**Report of Analysis**

<b>Client Sample ID:</b>	TRIP-1	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-1	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene <sup>a</sup>	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		83-118%
17060-07-0	1,2-Dichloroethane-D4	85%		79-125%
2037-26-5	Toluene-D8	102%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	TRIP-1	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-1	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits low.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

4.2

4

**Client Sample ID:** SMW-11-20171213**Lab Sample ID:** FA50344-2**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49979.D	1	12/29/17 13:37	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	61.4	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	88%		74-125%
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2037-26-5	Toluene-D8	107%		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.2  
4**Client Sample ID:** SMW-11-20171213**Lab Sample ID:** FA50344-2**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	P54584.D	1	12/22/17 19:17	AJ	n/a	n/a	VP2071
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.2  
4

<b>Client Sample ID:</b>	SMW-11-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-2	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene <sup>a</sup>	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		83-118%
17060-07-0	1,2-Dichloroethane-D4	86%		79-125%
2037-26-5	Toluene-D8	100%		85-112%
460-00-4	4-Bromofluorobenzene	94%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-11-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-2	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits low.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

4.3  
4

<b>Client Sample ID:</b>	PZ-06-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-3	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B BY SIM		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49980.D	20	12/29/17 14:02	MM	n/a	n/a	VZ1876
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	1250	20	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	89%		74-125%
2037-26-5	Toluene-D8	105%		88-111%

(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

4.3  
4**Client Sample ID:** PZ-06-20171213**Lab Sample ID:** FA50344-3**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	P54585.D	10	12/22/17 19:41	AJ	n/a	n/a	VP2071
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	250	ug/l	
71-43-2	Benzene	18.6	10	ug/l	
108-86-1	Bromobenzene	ND	10	ug/l	
74-97-5	Bromo(chloromethane)	ND	10	ug/l	
75-27-4	Bromodichloromethane	ND	10	ug/l	
75-25-2	Bromoform	ND	10	ug/l	
78-93-3	2-Butanone (MEK)	ND	50	ug/l	
104-51-8	n-Butylbenzene	ND	10	ug/l	
135-98-8	sec-Butylbenzene	ND	10	ug/l	
98-06-6	tert-Butylbenzene	ND	10	ug/l	
75-15-0	Carbon Disulfide	ND	20	ug/l	
56-23-5	Carbon Tetrachloride	ND	10	ug/l	
108-90-7	Chlorobenzene	ND	10	ug/l	
75-00-3	Chloroethane	476	20	ug/l	
67-66-3	Chloroform	ND	10	ug/l	
95-49-8	o-Chlorotoluene	ND	10	ug/l	
106-43-4	p-Chlorotoluene	ND	10	ug/l	
124-48-1	Dibromo(chloromethane)	ND	10	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	50	ug/l	
106-93-4	1,2-Dibromoethane	ND	20	ug/l	
75-71-8	Dichlorodifluoromethane	ND	20	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	10	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	10	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	10	ug/l	
75-34-3	1,1-Dichloroethane	17.1	10	ug/l	
107-06-2	1,2-Dichloroethane	ND	10	ug/l	
75-35-4	1,1-Dichloroethylene	ND	10	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	10	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	10	ug/l	
78-87-5	1,2-Dichloropropane	ND	10	ug/l	
142-28-9	1,3-Dichloropropane	ND	10	ug/l	
594-20-7	2,2-Dichloropropane	ND	10	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-06-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-3	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	10	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	10	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	10	ug/l	
100-41-4	Ethylbenzene	ND	10	ug/l	
87-68-3	Hexachlorobutadiene <sup>a</sup>	ND	20	ug/l	
591-78-6	2-Hexanone	ND	100	ug/l	
98-82-8	Isopropylbenzene	ND	10	ug/l	
99-87-6	p-Isopropyltoluene	ND	10	ug/l	
74-83-9	Methyl Bromide	ND	20	ug/l	
74-87-3	Methyl Chloride	ND	20	ug/l	
74-95-3	Methylene Bromide	ND	20	ug/l	
75-09-2	Methylene Chloride	ND	50	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	50	ug/l	
91-20-3	Naphthalene	ND	50	ug/l	
103-65-1	n-Propylbenzene	ND	10	ug/l	
100-42-5	Styrene	ND	10	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	10	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	10	ug/l	
127-18-4	Tetrachloroethylene	ND	10	ug/l	
108-88-3	Toluene	794	10	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	20	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	20	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	10	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	10	ug/l	
79-01-6	Trichloroethylene	ND	10	ug/l	
75-69-4	Trichlorofluoromethane	ND	20	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	20	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	10	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	10	ug/l	
75-01-4	Vinyl Chloride	ND	10	ug/l	
	m,p-Xylene	ND	20	ug/l	
95-47-6	o-Xylene	ND	10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		83-118%
17060-07-0	1,2-Dichloroethane-D4	87%		79-125%
2037-26-5	Toluene-D8	102%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	PZ-06-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-3	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits low.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

<b>Client Sample ID:</b>	SMW-03-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-4	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	P54586.D	2	12/22/17 20:06	AJ	n/a	n/a	VP2071
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	50	ug/l	
71-43-2	Benzene	ND	2.0	ug/l	
108-86-1	Bromobenzene	ND	2.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	2.0	ug/l	
75-27-4	Bromodichloromethane	ND	2.0	ug/l	
75-25-2	Bromoform	ND	2.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	ug/l	
104-51-8	n-Butylbenzene	ND	2.0	ug/l	
135-98-8	sec-Butylbenzene	ND	2.0	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	ug/l	
75-15-0	Carbon Disulfide	ND	4.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	2.0	ug/l	
108-90-7	Chlorobenzene	ND	2.0	ug/l	
75-00-3	Chloroethane	ND	4.0	ug/l	
67-66-3	Chloroform	ND	2.0	ug/l	
95-49-8	o-Chlorotoluene	ND	2.0	ug/l	
106-43-4	p-Chlorotoluene	ND	2.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	2.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	ug/l	
106-93-4	1,2-Dibromoethane	ND	4.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	4.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	2.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	2.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	2.0	ug/l	
75-34-3	1,1-Dichloroethane	11.0	2.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	2.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	107	2.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	4.5	2.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	2.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	2.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

44

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-03-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-4	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	2.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	ug/l	
100-41-4	Ethylbenzene	ND	2.0	ug/l	
87-68-3	Hexachlorobutadiene <sup>a</sup>	ND	4.0	ug/l	
591-78-6	2-Hexanone	ND	20	ug/l	
98-82-8	Isopropylbenzene	ND	2.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	2.0	ug/l	
74-83-9	Methyl Bromide	ND	4.0	ug/l	
74-87-3	Methyl Chloride	ND	4.0	ug/l	
74-95-3	Methylene Bromide	ND	4.0	ug/l	
75-09-2	Methylene Chloride	ND	10	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	10	ug/l	
91-20-3	Naphthalene	ND	10	ug/l	
103-65-1	n-Propylbenzene	ND	2.0	ug/l	
100-42-5	Styrene	ND	2.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	ug/l	
127-18-4	Tetrachloroethylene	ND	2.0	ug/l	
108-88-3	Toluene	ND	2.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	4.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	2.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	2.0	ug/l	
79-01-6	Trichloroethylene	17.0	2.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	4.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	4.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.0	ug/l	
75-01-4	Vinyl Chloride	ND	2.0	ug/l	
	m,p-Xylene	ND	4.0	ug/l	
95-47-6	o-Xylene	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		83-118%
17060-07-0	1,2-Dichloroethane-D4	85%		79-125%
2037-26-5	Toluene-D8	103%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-03-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-4	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits low.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

45  
4**Client Sample ID:** SMW-40-20171213**Lab Sample ID:** FA50344-5**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	P54587.D	50	12/22/17 20:30	AJ	n/a	n/a	VP2071
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	1300	ug/l	
71-43-2	Benzene	209	50	ug/l	
108-86-1	Bromobenzene	ND	50	ug/l	
74-97-5	Bromo(chloromethane)	ND	50	ug/l	
75-27-4	Bromodichloromethane	ND	50	ug/l	
75-25-2	Bromoform	ND	50	ug/l	
78-93-3	2-Butanone (MEK)	ND	250	ug/l	
104-51-8	n-Butylbenzene	ND	50	ug/l	
135-98-8	sec-Butylbenzene	ND	50	ug/l	
98-06-6	tert-Butylbenzene	ND	50	ug/l	
75-15-0	Carbon Disulfide	ND	100	ug/l	
56-23-5	Carbon Tetrachloride	ND	50	ug/l	
108-90-7	Chlorobenzene	ND	50	ug/l	
75-00-3	Chloroethane	ND	100	ug/l	
67-66-3	Chloroform	ND	50	ug/l	
95-49-8	o-Chlorotoluene	ND	50	ug/l	
106-43-4	p-Chlorotoluene	ND	50	ug/l	
124-48-1	Dibromochloromethane	ND	50	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	250	ug/l	
106-93-4	1,2-Dibromoethane	ND	100	ug/l	
75-71-8	Dichlorodifluoromethane	ND	100	ug/l	
95-50-1	1,2-Dichlorobenzene	95.5	50	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	50	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	ug/l	
75-34-3	1,1-Dichloroethane	1190	50	ug/l	
107-06-2	1,2-Dichloroethane	ND	50	ug/l	
75-35-4	1,1-Dichloroethylene	84.7	50	ug/l	
156-59-2	cis-1,2-Dichloroethylene	3060	50	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	50	ug/l	
78-87-5	1,2-Dichloropropane	ND	50	ug/l	
142-28-9	1,3-Dichloropropane	ND	50	ug/l	
594-20-7	2,2-Dichloropropane	ND	50	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-40-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-5	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	50	ug/l	
100-41-4	Ethylbenzene	86.7	50	ug/l	
87-68-3	Hexachlorobutadiene <sup>a</sup>	ND	100	ug/l	
591-78-6	2-Hexanone	ND	500	ug/l	
98-82-8	Isopropylbenzene	ND	50	ug/l	
99-87-6	p-Isopropyltoluene	ND	50	ug/l	
74-83-9	Methyl Bromide	ND	100	ug/l	
74-87-3	Methyl Chloride	ND	100	ug/l	
74-95-3	Methylene Bromide	ND	100	ug/l	
75-09-2	Methylene Chloride	ND	250	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	250	ug/l	
91-20-3	Naphthalene	ND	250	ug/l	
103-65-1	n-Propylbenzene	ND	50	ug/l	
100-42-5	Styrene	ND	50	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	ug/l	
127-18-4	Tetrachloroethylene	ND	50	ug/l	
108-88-3	Toluene	111	50	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	100	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	100	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	50	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	50	ug/l	
79-01-6	Trichloroethylene	159	50	ug/l	
75-69-4	Trichlorofluoromethane	ND	100	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	100	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	50	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	50	ug/l	
75-01-4	Vinyl Chloride	966	50	ug/l	
	m,p-Xylene	ND	100	ug/l	
95-47-6	o-Xylene	ND	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	92%		83-118%
17060-07-0	1,2-Dichloroethane-D4	86%		79-125%
2037-26-5	Toluene-D8	103%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-40-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-5	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits low.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis****Client Sample ID:** DMW-08-20171213**Lab Sample ID:** FA50344-6**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52312.D	1	12/22/17 19:24	TD	n/a	n/a	VI1526
Run #2 <sup>a</sup>	P54910.D	5	01/08/18 17:01	AJ	n/a	n/a	VP2083

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane <sup>b</sup>	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	15.1	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.6	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	89.4 <sup>c</sup>	5.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	89.4 <sup>c</sup>	10	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.6  
4

<b>Client Sample ID:</b>	DMW-08-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-6	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone <sup>b</sup>	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	2.0	1.0	ug/l	
108-88-3	Toluene	2.6	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	7.6	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	65.6	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	105%	104%	79-125%
2037-26-5	Toluene-D8	97%	101%	85-112%
460-00-4	4-Bromofluorobenzene	96%	93%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	DMW-08-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-6	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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- (a) Sample re-analyzed beyond hold time; reported results are considered minimum values.  
 (b) Associated CCV outside of control limits high, sample was ND.  
 (c) Result is from Run# 2

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**Report of Analysis****Client Sample ID:** SMW-21-20171213**Lab Sample ID:** FA50344-7**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52313.D	1	12/22/17 19:46	TD	n/a	n/a	VI1526
Run #2 <sup>a</sup>	P54911.D	20	01/08/18 17:25	AJ	n/a	n/a	VP2083

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	8.4	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND <sup>b</sup>	40	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-21-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-7	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone c	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	3.0	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	105%	106%	79-125%
2037-26-5	Toluene-D8	99%	103%	85-112%
460-00-4	4-Bromofluorobenzene	96%	94%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-21-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-7	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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- (a) Sample re-analyzed beyond hold time; reported results are considered minimum values.  
 (b) Result is from Run# 2  
 (c) Associated CCV outside of control limits high, sample was ND.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

47

4

**Report of Analysis**

**Client Sample ID:** FB-01-20171213  
**Lab Sample ID:** FA50344-8  
**Matrix:** AQ - Field Blank Water  
**Method:** SW846 8260B  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52314.D	1	12/22/17 20:10	TD	n/a	n/a	VI1526
Run #2							

**Purge Volume**  
Run #1 5.0 ml  
Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane <sup>a</sup>	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	FB-01-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-8	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone <sup>a</sup>	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	107%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	97%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	FB-01-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-8	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

4

4

<b>Client Sample ID:</b>	SMW-09-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-9	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52315.D	25	12/22/17 20:34	TD	n/a	n/a	VI1526
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	630	ug/l	
71-43-2	Benzene	ND	25	ug/l	
108-86-1	Bromobenzene	ND	25	ug/l	
74-97-5	Bromo(chloromethane)	ND	25	ug/l	
75-27-4	Bromodichloromethane	ND	25	ug/l	
75-25-2	Bromoform	ND	25	ug/l	
78-93-3	2-Butanone (MEK)	ND	130	ug/l	
104-51-8	n-Butylbenzene	ND	25	ug/l	
135-98-8	sec-Butylbenzene	ND	25	ug/l	
98-06-6	tert-Butylbenzene	ND	25	ug/l	
75-15-0	Carbon Disulfide	ND	50	ug/l	
56-23-5	Carbon Tetrachloride	ND	25	ug/l	
108-90-7	Chlorobenzene	ND	25	ug/l	
75-00-3	Chloroethane <sup>a</sup>	ND	50	ug/l	
67-66-3	Chloroform	ND	25	ug/l	
95-49-8	o-Chlorotoluene	ND	25	ug/l	
106-43-4	p-Chlorotoluene	ND	25	ug/l	
124-48-1	Dibromo(chloromethane)	ND	25	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	130	ug/l	
106-93-4	1,2-Dibromoethane	ND	50	ug/l	
75-71-8	Dichlorodifluoromethane	ND	50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	25	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	25	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	25	ug/l	
75-34-3	1,1-Dichloroethane	121	25	ug/l	
107-06-2	1,2-Dichloroethane	ND	25	ug/l	
75-35-4	1,1-Dichloroethylene	ND	25	ug/l	
156-59-2	cis-1,2-Dichloroethylene	121	25	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	25	ug/l	
78-87-5	1,2-Dichloropropane	ND	25	ug/l	
142-28-9	1,3-Dichloropropane	ND	25	ug/l	
594-20-7	2,2-Dichloropropane	ND	25	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-09-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-9	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	25	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	25	ug/l	
100-41-4	Ethylbenzene	ND	25	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	ug/l	
591-78-6	2-Hexanone <sup>a</sup>	ND	250	ug/l	
98-82-8	Isopropylbenzene	ND	25	ug/l	
99-87-6	p-Isopropyltoluene	ND	25	ug/l	
74-83-9	Methyl Bromide	ND	50	ug/l	
74-87-3	Methyl Chloride	ND	50	ug/l	
74-95-3	Methylene Bromide	ND	50	ug/l	
75-09-2	Methylene Chloride	ND	130	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	130	ug/l	
91-20-3	Naphthalene	ND	130	ug/l	
103-65-1	n-Propylbenzene	ND	25	ug/l	
100-42-5	Styrene	ND	25	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	25	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	25	ug/l	
127-18-4	Tetrachloroethylene	ND	25	ug/l	
108-88-3	Toluene	ND	25	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	50	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	25	ug/l	
79-01-6	Trichloroethylene	ND	25	ug/l	
75-69-4	Trichlorofluoromethane	ND	50	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	25	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	25	ug/l	
75-01-4	Vinyl Chloride	1170	25	ug/l	
	m,p-Xylene	ND	50	ug/l	
95-47-6	o-Xylene	ND	25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	95%		85-112%
460-00-4	4-Bromofluorobenzene	97%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-09-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-9	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

4.10

4

**Client Sample ID:** SMW-26-20171213**Lab Sample ID:** FA50344-10**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49984.D	1	12/29/17 15:40	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	31.5	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	91%		74-125%
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2037-26-5	Toluene-D8	105%		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 3

4.10  
4**Client Sample ID:** SMW-26-20171213**Lab Sample ID:** FA50344-10**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52316.D	25	12/22/17 20:57	TD	n/a	n/a	VI1526
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	630	ug/l	
71-43-2	Benzene	ND	25	ug/l	
108-86-1	Bromobenzene	ND	25	ug/l	
74-97-5	Bromo(chloromethane)	ND	25	ug/l	
75-27-4	Bromodichloromethane	ND	25	ug/l	
75-25-2	Bromoform	ND	25	ug/l	
78-93-3	2-Butanone (MEK)	ND	130	ug/l	
104-51-8	n-Butylbenzene	ND	25	ug/l	
135-98-8	sec-Butylbenzene	ND	25	ug/l	
98-06-6	tert-Butylbenzene	ND	25	ug/l	
75-15-0	Carbon Disulfide	ND	50	ug/l	
56-23-5	Carbon Tetrachloride	ND	25	ug/l	
108-90-7	Chlorobenzene	ND	25	ug/l	
75-00-3	Chloroethane <sup>a</sup>	ND	50	ug/l	
67-66-3	Chloroform	ND	25	ug/l	
95-49-8	o-Chlorotoluene	ND	25	ug/l	
106-43-4	p-Chlorotoluene	ND	25	ug/l	
124-48-1	Dibromo(chloromethane)	ND	25	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	130	ug/l	
106-93-4	1,2-Dibromoethane	ND	50	ug/l	
75-71-8	Dichlorodifluoromethane	ND	50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	25	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	25	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	25	ug/l	
75-34-3	1,1-Dichloroethane	129	25	ug/l	
107-06-2	1,2-Dichloroethane	ND	25	ug/l	
75-35-4	1,1-Dichloroethylene	199	25	ug/l	
156-59-2	cis-1,2-Dichloroethylene	1310	25	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	25	ug/l	
78-87-5	1,2-Dichloropropane	ND	25	ug/l	
142-28-9	1,3-Dichloropropane	ND	25	ug/l	
594-20-7	2,2-Dichloropropane	ND	25	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-26-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-10	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	25	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	25	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	25	ug/l	
100-41-4	Ethylbenzene	ND	25	ug/l	
87-68-3	Hexachlorobutadiene	ND	50	ug/l	
591-78-6	2-Hexanone <sup>a</sup>	ND	250	ug/l	
98-82-8	Isopropylbenzene	ND	25	ug/l	
99-87-6	p-Isopropyltoluene	ND	25	ug/l	
74-83-9	Methyl Bromide	ND	50	ug/l	
74-87-3	Methyl Chloride	ND	50	ug/l	
74-95-3	Methylene Bromide	ND	50	ug/l	
75-09-2	Methylene Chloride	ND	130	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	130	ug/l	
91-20-3	Naphthalene	ND	130	ug/l	
103-65-1	n-Propylbenzene	ND	25	ug/l	
100-42-5	Styrene	ND	25	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	25	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	25	ug/l	
127-18-4	Tetrachloroethylene	ND	25	ug/l	
108-88-3	Toluene	ND	25	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	50	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	25	ug/l	
79-01-6	Trichloroethylene	106	25	ug/l	
75-69-4	Trichlorofluoromethane	ND	50	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	50	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	25	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	25	ug/l	
75-01-4	Vinyl Chloride	854	25	ug/l	
	m,p-Xylene	ND	50	ug/l	
95-47-6	o-Xylene	ND	25	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		83-118%
17060-07-0	1,2-Dichloroethane-D4	107%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	97%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.10  
4

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-26-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-10	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.10

4

**Report of Analysis**

Page 1 of 3

<b>Client Sample ID:</b>	SMW-12-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-11	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52317.D	1	12/22/17 21:21	TD	n/a	n/a	VI1526
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane <sup>a</sup>	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	22.7	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.11  
4

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-12-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-11	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone <sup>a</sup>	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	3.8	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	9.9	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	95%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.11  
4

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-12-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-11	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.11  
4

**Report of Analysis**

4.12

4

**Client Sample ID:** SMW-12-20171213-D1**Lab Sample ID:** FA50344-12**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52318.D	1	12/22/17 21:44	TD	n/a	n/a	VI1526
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane <sup>a</sup>	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	22.8	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-12-20171213-D1	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-12	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone <sup>a</sup>	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	4.1	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	10.1	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	98%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-12-20171213-D1	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-12	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Associated CCV outside of control limits high, sample was ND.

4.12

4

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.13

4

**Client Sample ID:** SMW-04-20171213**Lab Sample ID:** FA50344-13**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	M0100549.D	1	12/26/17 15:27	WV	n/a	n/a	VM4322
Run #2	J0988403.D	5	12/22/17 20:21	WV	n/a	n/a	VJ5783

**Purge Volume**

Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone <sup>a</sup>	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	2.1	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	6.1	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	3.2	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	20.8	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.13

4

<b>Client Sample ID:</b>	SMW-04-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-13	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	173 <sup>b</sup>	5.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	19.5	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	71.1	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	32.6	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	91%	110%	79-125%
2037-26-5	Toluene-D8	96%	99%	85-112%
460-00-4	4-Bromofluorobenzene	99%	97%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-04-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-13	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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- (a) Associated CCV outside of control limits high, sample was ND.  
 (b) Result is from Run# 2

4.13

4

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

**Client Sample ID:** SMW-06-20171213**Lab Sample ID:** FA50344-14**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49983.D	1	12/29/17 15:16	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	1.8	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	91%		74-125%
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2037-26-5	Toluene-D8	105%		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

4.14

4

**Report of Analysis**

4.14

4

**Client Sample ID:** SMW-06-20171213**Lab Sample ID:** FA50344-14**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	M0100550.D	1	12/26/17 15:50	WV	n/a	n/a	VM4322
Run #2	J0988404.D	5	12/22/17 20:45	WV	n/a	n/a	VJ5783

**Purge Volume**

Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone <sup>a</sup>	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	3.5	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	5.7	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	207 <sup>b</sup>	5.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	2.8	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-06-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-14	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	169 <sup>b</sup>	5.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	32.7	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	146 <sup>b</sup>	5.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	92%	110%	79-125%
2037-26-5	Toluene-D8	94%	98%	85-112%
460-00-4	4-Bromofluorobenzene	104%	93%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.14

4

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-06-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-14	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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- (a) Associated CCV outside of control limits high, sample was ND.  
 (b) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.14

4

**Report of Analysis**

Page 1 of 2

4.15

4

**Client Sample ID:** SMW-07-20171213**Lab Sample ID:** FA50344-15**Date Sampled:** 12/13/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988405.D	1000	12/22/17 21:09	WV	n/a	n/a	VJ5783
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25000	ug/l	
71-43-2	Benzene	ND	1000	ug/l	
108-86-1	Bromobenzene	ND	1000	ug/l	
74-97-5	Bromo(chloromethane)	ND	1000	ug/l	
75-27-4	Bromodichloromethane	ND	1000	ug/l	
75-25-2	Bromoform	ND	1000	ug/l	
78-93-3	2-Butanone (MEK)	ND	5000	ug/l	
104-51-8	n-Butylbenzene	ND	1000	ug/l	
135-98-8	sec-Butylbenzene	ND	1000	ug/l	
98-06-6	tert-Butylbenzene	ND	1000	ug/l	
75-15-0	Carbon Disulfide	ND	2000	ug/l	
56-23-5	Carbon Tetrachloride	ND	1000	ug/l	
108-90-7	Chlorobenzene	ND	1000	ug/l	
75-00-3	Chloroethane	ND	2000	ug/l	
67-66-3	Chloroform	ND	1000	ug/l	
95-49-8	o-Chlorotoluene	ND	1000	ug/l	
106-43-4	p-Chlorotoluene	ND	1000	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1000	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5000	ug/l	
106-93-4	1,2-Dibromoethane	ND	2000	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2000	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1000	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1000	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1000	ug/l	
75-34-3	1,1-Dichloroethane	1530	1000	ug/l	
107-06-2	1,2-Dichloroethane	ND	1000	ug/l	
75-35-4	1,1-Dichloroethylene	1460	1000	ug/l	
156-59-2	cis-1,2-Dichloroethylene	19600	1000	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1000	ug/l	
78-87-5	1,2-Dichloropropane	ND	1000	ug/l	
142-28-9	1,3-Dichloropropane	ND	1000	ug/l	
594-20-7	2,2-Dichloropropane	ND	1000	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.15

4

<b>Client Sample ID:</b>	SMW-07-20171213	<b>Date Sampled:</b>	12/13/17
<b>Lab Sample ID:</b>	FA50344-15	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1000	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1000	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1000	ug/l	
100-41-4	Ethylbenzene	5490	1000	ug/l	
87-68-3	Hexachlorobutadiene	ND	2000	ug/l	
591-78-6	2-Hexanone	ND	10000	ug/l	
98-82-8	Isopropylbenzene	ND	1000	ug/l	
99-87-6	p-Isopropyltoluene	ND	1000	ug/l	
74-83-9	Methyl Bromide	ND	2000	ug/l	
74-87-3	Methyl Chloride	ND	2000	ug/l	
74-95-3	Methylene Bromide	ND	2000	ug/l	
75-09-2	Methylene Chloride	ND	5000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5000	ug/l	
91-20-3	Naphthalene	ND	5000	ug/l	
103-65-1	n-Propylbenzene	ND	1000	ug/l	
100-42-5	Styrene	ND	1000	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1000	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1000	ug/l	
127-18-4	Tetrachloroethylene	22000	1000	ug/l	
108-88-3	Toluene	80600	1000	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2000	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2000	ug/l	
71-55-6	1,1,1-Trichloroethane	8370	1000	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1000	ug/l	
79-01-6	Trichloroethylene	22200	1000	ug/l	
75-69-4	Trichlorofluoromethane	ND	2000	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2000	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1000	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1000	ug/l	
75-01-4	Vinyl Chloride	ND	1000	ug/l	
	m,p-Xylene	15500	2000	ug/l	
95-47-6	o-Xylene	5120	1000	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	112%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.16  
4**Client Sample ID:** PZ-08-20171214**Lab Sample ID:** FA50344-16**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988455.D	1	12/26/17 14:13	MM	n/a	n/a	VJ5785
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	42.2	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.16  
4

<b>Client Sample ID:</b>	PZ-08-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-16	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	1.4	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	12.5	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	111%		79-125%
2037-26-5	Toluene-D8	98%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

<b>Client Sample ID:</b>	PZ-07-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-17	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988456.D	1	12/26/17 14:37	MM	n/a	n/a	VJ5785
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	1.9	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.6	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	67.8	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	1.6	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.17  
4

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-07-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-17	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	8.9	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	14.4	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	112%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	94%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.17  
4

**Report of Analysis**4.18  
4**Client Sample ID:** PZ-04-20171214**Lab Sample ID:** FA50344-18**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988458.D	5	12/26/17 15:24	MM	n/a	n/a	VJ5785
Run #2	I52393.D	20	12/27/17 15:34	MM	n/a	n/a	VI1530

**Purge Volume**

Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	130	ug/l	
71-43-2	Benzene	27.5	5.0	ug/l	
108-86-1	Bromobenzene	ND	5.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	5.0	ug/l	
75-27-4	Bromodichloromethane	ND	5.0	ug/l	
75-25-2	Bromoform	ND	5.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	25	ug/l	
104-51-8	n-Butylbenzene	ND	5.0	ug/l	
135-98-8	sec-Butylbenzene	ND	5.0	ug/l	
98-06-6	tert-Butylbenzene	ND	5.0	ug/l	
75-15-0	Carbon Disulfide	ND	10	ug/l	
56-23-5	Carbon Tetrachloride	ND	5.0	ug/l	
108-90-7	Chlorobenzene	ND	5.0	ug/l	
75-00-3	Chloroethane	780 <sup>a</sup>	40	ug/l	
67-66-3	Chloroform	ND	5.0	ug/l	
95-49-8	o-Chlorotoluene	ND	5.0	ug/l	
106-43-4	p-Chlorotoluene	ND	5.0	ug/l	
124-48-1	Dibromochloromethane	ND	5.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	25	ug/l	
106-93-4	1,2-Dibromoethane	ND	10	ug/l	
75-71-8	Dichlorodifluoromethane	ND	10	ug/l	
95-50-1	1,2-Dichlorobenzene	5.8	5.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	ug/l	
75-34-3	1,1-Dichloroethane	87.3	5.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	5.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	5.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	5.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	5.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	5.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	5.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	5.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-04-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-18	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	5.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ug/l	
100-41-4	Ethylbenzene	923 <sup>a</sup>	20	ug/l	
87-68-3	Hexachlorobutadiene	ND	10	ug/l	
591-78-6	2-Hexanone	ND	50	ug/l	
98-82-8	Isopropylbenzene	9.7	5.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	5.0	ug/l	
74-83-9	Methyl Bromide	ND	10	ug/l	
74-87-3	Methyl Chloride	ND	10	ug/l	
74-95-3	Methylene Bromide	ND	10	ug/l	
75-09-2	Methylene Chloride	ND	25	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	25	ug/l	
91-20-3	Naphthalene	ND	25	ug/l	
103-65-1	n-Propylbenzene	14.4	5.0	ug/l	
100-42-5	Styrene	ND	5.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	5.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ug/l	
127-18-4	Tetrachloroethylene	ND	5.0	ug/l	
108-88-3	Toluene	183	5.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	10	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	10	ug/l	
71-55-6	1,1,1-Trichloroethane	7.4	5.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ug/l	
79-01-6	Trichloroethylene	ND	5.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	10	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	10	ug/l	
95-63-6	1,2,4-Trimethylbenzene	75.4	5.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	12.4	5.0	ug/l	
75-01-4	Vinyl Chloride	ND	5.0	ug/l	
	m,p-Xylene	1470 <sup>a</sup>	40	ug/l	
95-47-6	o-Xylene	276 <sup>a</sup>	20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%	97%	83-118%
17060-07-0	1,2-Dichloroethane-D4	112%	101%	79-125%
2037-26-5	Toluene-D8	96%	99%	85-112%
460-00-4	4-Bromofluorobenzene	93%	101%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	PZ-04-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-18	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.18

4

**Report of Analysis**

Page 1 of 1

4.19  
4**Client Sample ID:** SMW-38-20171214**Lab Sample ID:** FA50344-19**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49981.D	5	12/29/17 14:26	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	88.0	5.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	87%		74-125%
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2037-26-5	Toluene-D8	112% <sup>b</sup>		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

(b) Outside control limits due to matrix interference.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.19

4

**Client Sample ID:** SMW-38-20171214**Lab Sample ID:** FA50344-19**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	I52394.D	50	12/27/17 15:57	MM	n/a	n/a	VI1530
Run #2	J0988459.D	100	12/26/17 15:48	MM	n/a	n/a	VJ5785
Run #3 <sup>a</sup>	J0988553.D	500	12/29/17 18:09	MM	n/a	n/a	VJ5789

**Purge Volume**

Run #1	5.0 ml
Run #2	5.0 ml
Run #3	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	1300	ug/l	
71-43-2	Benzene	70.3	50	ug/l	
108-86-1	Bromobenzene	ND	50	ug/l	
74-97-5	Bromochloromethane	ND	50	ug/l	
75-27-4	Bromodichloromethane	ND	50	ug/l	
75-25-2	Bromoform	ND	50	ug/l	
78-93-3	2-Butanone (MEK)	ND	250	ug/l	
104-51-8	n-Butylbenzene	ND	50	ug/l	
135-98-8	sec-Butylbenzene	ND	50	ug/l	
98-06-6	tert-Butylbenzene	ND	50	ug/l	
75-15-0	Carbon Disulfide	ND	100	ug/l	
56-23-5	Carbon Tetrachloride	ND	50	ug/l	
108-90-7	Chlorobenzene	ND	50	ug/l	
75-00-3	Chloroethane	ND	100	ug/l	
67-66-3	Chloroform	ND	50	ug/l	
95-49-8	o-Chlorotoluene	ND	50	ug/l	
106-43-4	p-Chlorotoluene	ND	50	ug/l	
124-48-1	Dibromochloromethane	ND	50	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	250	ug/l	
106-93-4	1,2-Dibromoethane	ND	100	ug/l	
75-71-8	Dichlorodifluoromethane	ND	100	ug/l	
95-50-1	1,2-Dichlorobenzene	63.3	50	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	50	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	50	ug/l	
75-34-3	1,1-Dichloroethane	1290	50	ug/l	
107-06-2	1,2-Dichloroethane	ND	50	ug/l	
75-35-4	1,1-Dichloroethylene	752	50	ug/l	
156-59-2	cis-1,2-Dichloroethylene	6430 <sup>b</sup>	100	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	50	ug/l	
78-87-5	1,2-Dichloropropane	ND	50	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	SMW-38-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-19	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
142-28-9	1,3-Dichloropropane	ND	50	ug/l	
594-20-7	2,2-Dichloropropane	ND	50	ug/l	
563-58-6	1,1-Dichloropropene	ND	50	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	50	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	50	ug/l	
100-41-4	Ethylbenzene	779	50	ug/l	
87-68-3	Hexachlorobutadiene	ND	100	ug/l	
591-78-6	2-Hexanone	ND	500	ug/l	
98-82-8	Isopropylbenzene	ND	50	ug/l	
99-87-6	p-Isopropyltoluene	ND	50	ug/l	
74-83-9	Methyl Bromide	ND	100	ug/l	
74-87-3	Methyl Chloride <sup>c</sup>	ND	100	ug/l	
74-95-3	Methylene Bromide	ND	100	ug/l	
75-09-2	Methylene Chloride	413	250	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	348	250	ug/l	
91-20-3	Naphthalene	ND	250	ug/l	
103-65-1	n-Propylbenzene	ND	50	ug/l	
100-42-5	Styrene	81.8	50	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	ug/l	
127-18-4	Tetrachloroethylene	2580	50	ug/l	
108-88-3	Toluene	4390	50	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	100	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	100	ug/l	
71-55-6	1,1,1-Trichloroethane	26600 <sup>d</sup>	500	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	50	ug/l	
79-01-6	Trichloroethylene	4060	50	ug/l	
75-69-4	Trichlorofluoromethane	ND	100	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	100	ug/l	
95-63-6	1,2,4-Trimethylbenzene	244	50	ug/l	
108-67-8	1,3,5-Trimethylbenzene	99.9	50	ug/l	
75-01-4	Vinyl Chloride	1990	50	ug/l	
	m,p-Xylene	1470	100	ug/l	
95-47-6	o-Xylene	560	50	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
1868-53-7	Dibromofluoromethane	99%	100%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	101%	108%	109%	79-125%
2037-26-5	Toluene-D8	99%	98%	96%	85-112%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.19  
4

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-38-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-19	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
460-00-4	4-Bromofluorobenzene	100%	93%	93%	83-118%

- (a) Sample re-analyzed beyond hold time; reported results are considered minimum values.  
 (b) Result is from Run# 2  
 (c) Associated CCV outside of control limits high, sample was ND.  
 (d) Result is from Run# 3

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

4.19

4

**Report of Analysis**

Page 1 of 1

4.20  
4**Client Sample ID:** SMW-37-20171214**Lab Sample ID:** FA50344-20**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49985.D	1	12/29/17 16:05	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane <sup>b</sup>	6.8	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	82%		74-125%
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2037-26-5	Toluene-D8	100%		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

(b) Associated internal standard response outside control limits.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis****Client Sample ID:** SMW-37-20171214**Lab Sample ID:** FA50344-20**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988460.D	200	12/26/17 16:12	MM	n/a	n/a	VJ5785
Run #2	I52395.D	500	12/27/17 16:20	MM	n/a	n/a	VI1530

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	5000	ug/l	
71-43-2	Benzene	ND	200	ug/l	
108-86-1	Bromobenzene	ND	200	ug/l	
74-97-5	Bromo(chloromethane)	ND	200	ug/l	
75-27-4	Bromodichloromethane	ND	200	ug/l	
75-25-2	Bromoform	ND	200	ug/l	
78-93-3	2-Butanone (MEK)	ND	1000	ug/l	
104-51-8	n-Butylbenzene	ND	200	ug/l	
135-98-8	sec-Butylbenzene	ND	200	ug/l	
98-06-6	tert-Butylbenzene	ND	200	ug/l	
75-15-0	Carbon Disulfide	ND	400	ug/l	
56-23-5	Carbon Tetrachloride	ND	200	ug/l	
108-90-7	Chlorobenzene	ND	200	ug/l	
75-00-3	Chloroethane	ND	400	ug/l	
67-66-3	Chloroform	ND	200	ug/l	
95-49-8	o-Chlorotoluene	ND	200	ug/l	
106-43-4	p-Chlorotoluene	ND	200	ug/l	
124-48-1	Dibromochloromethane	ND	200	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1000	ug/l	
106-93-4	1,2-Dibromoethane	ND	400	ug/l	
75-71-8	Dichlorodifluoromethane	ND	400	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	200	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	200	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	200	ug/l	
75-34-3	1,1-Dichloroethane	ND	200	ug/l	
107-06-2	1,2-Dichloroethane	ND	200	ug/l	
75-35-4	1,1-Dichloroethylene	ND	200	ug/l	
156-59-2	cis-1,2-Dichloroethylene	22700 <sup>a</sup>	500	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	200	ug/l	
78-87-5	1,2-Dichloropropane	ND	200	ug/l	
142-28-9	1,3-Dichloropropane	ND	200	ug/l	
594-20-7	2,2-Dichloropropane	ND	200	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.20  
4

<b>Client Sample ID:</b>	SMW-37-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-20	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	200	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	200	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	200	ug/l	
100-41-4	Ethylbenzene	ND	200	ug/l	
87-68-3	Hexachlorobutadiene	ND	400	ug/l	
591-78-6	2-Hexanone	ND	2000	ug/l	
98-82-8	Isopropylbenzene	ND	200	ug/l	
99-87-6	p-Isopropyltoluene	ND	200	ug/l	
74-83-9	Methyl Bromide	ND	400	ug/l	
74-87-3	Methyl Chloride	ND	400	ug/l	
74-95-3	Methylene Bromide	ND	400	ug/l	
75-09-2	Methylene Chloride	ND	1000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1000	ug/l	
91-20-3	Naphthalene	ND	1000	ug/l	
103-65-1	n-Propylbenzene	ND	200	ug/l	
100-42-5	Styrene	ND	200	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	200	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	200	ug/l	
127-18-4	Tetrachloroethylene	8320	200	ug/l	
108-88-3	Toluene	ND	200	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	400	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	400	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	200	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	200	ug/l	
79-01-6	Trichloroethylene	3460	200	ug/l	
75-69-4	Trichlorofluoromethane	ND	400	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	400	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	200	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	200	ug/l	
75-01-4	Vinyl Chloride	ND	200	ug/l	
	m,p-Xylene	ND	400	ug/l	
95-47-6	o-Xylene	ND	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%	98%	83-118%
17060-07-0	1,2-Dichloroethane-D4	111%	102%	79-125%
2037-26-5	Toluene-D8	98%	99%	85-112%
460-00-4	4-Bromofluorobenzene	96%	101%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-37-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-20	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.20  
4

**Report of Analysis**4.21  
4**Client Sample ID:** SMW-39-20171214**Lab Sample ID:** FA50344-21**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988461.D	100	12/26/17 16:36	MM	n/a	n/a	VJ5785
Run #2	I52396.D	500	12/27/17 16:43	MM	n/a	n/a	VI1530

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	2500	ug/l	
71-43-2	Benzene	ND	100	ug/l	
108-86-1	Bromobenzene	ND	100	ug/l	
74-97-5	Bromo(chloromethane)	ND	100	ug/l	
75-27-4	Bromodichloromethane	ND	100	ug/l	
75-25-2	Bromoform	ND	100	ug/l	
78-93-3	2-Butanone (MEK)	ND	500	ug/l	
104-51-8	n-Butylbenzene	ND	100	ug/l	
135-98-8	sec-Butylbenzene	ND	100	ug/l	
98-06-6	tert-Butylbenzene	ND	100	ug/l	
75-15-0	Carbon Disulfide	ND	200	ug/l	
56-23-5	Carbon Tetrachloride	ND	100	ug/l	
108-90-7	Chlorobenzene	ND	100	ug/l	
75-00-3	Chloroethane	ND	200	ug/l	
67-66-3	Chloroform	ND	100	ug/l	
95-49-8	o-Chlorotoluene	ND	100	ug/l	
106-43-4	p-Chlorotoluene	ND	100	ug/l	
124-48-1	Dibromochloromethane	ND	100	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	500	ug/l	
106-93-4	1,2-Dibromoethane	ND	200	ug/l	
75-71-8	Dichlorodifluoromethane	ND	200	ug/l	
95-50-1	1,2-Dichlorobenzene	137	100	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	100	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	100	ug/l	
75-34-3	1,1-Dichloroethane	ND	100	ug/l	
107-06-2	1,2-Dichloroethane	ND	100	ug/l	
75-35-4	1,1-Dichloroethylene	324	100	ug/l	
156-59-2	cis-1,2-Dichloroethylene	4440	100	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	100	ug/l	
78-87-5	1,2-Dichloropropane	ND	100	ug/l	
142-28-9	1,3-Dichloropropane	ND	100	ug/l	
594-20-7	2,2-Dichloropropane	ND	100	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.21  
4

<b>Client Sample ID:</b>	SMW-39-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-21	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	100	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	100	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	100	ug/l	
100-41-4	Ethylbenzene	ND	100	ug/l	
87-68-3	Hexachlorobutadiene	ND	200	ug/l	
591-78-6	2-Hexanone	ND	1000	ug/l	
98-82-8	Isopropylbenzene	ND	100	ug/l	
99-87-6	p-Isopropyltoluene	ND	100	ug/l	
74-83-9	Methyl Bromide	ND	200	ug/l	
74-87-3	Methyl Chloride	ND	200	ug/l	
74-95-3	Methylene Bromide	ND	200	ug/l	
75-09-2	Methylene Chloride	ND	500	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	500	ug/l	
91-20-3	Naphthalene	ND	500	ug/l	
103-65-1	n-Propylbenzene	ND	100	ug/l	
100-42-5	Styrene	ND	100	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	100	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	100	ug/l	
127-18-4	Tetrachloroethylene	24400 <sup>a</sup>	500	ug/l	
108-88-3	Toluene	ND	100	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	200	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	200	ug/l	
71-55-6	1,1,1-Trichloroethane	1530	100	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	100	ug/l	
79-01-6	Trichloroethylene	20800 <sup>a</sup>	500	ug/l	
75-69-4	Trichlorofluoromethane	ND	200	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	200	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	100	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	100	ug/l	
75-01-4	Vinyl Chloride	ND	100	ug/l	
	m,p-Xylene	ND	200	ug/l	
95-47-6	o-Xylene	ND	100	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%	97%	83-118%
17060-07-0	1,2-Dichloroethane-D4	110%	101%	79-125%
2037-26-5	Toluene-D8	97%	100%	85-112%
460-00-4	4-Bromofluorobenzene	93%	100%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-39-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-21	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.2.1  
4

**Report of Analysis**4.22  
4**Client Sample ID:** SMW-30-20171214**Lab Sample ID:** FA50344-22**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988462.D	2	12/26/17 16:59	MM	n/a	n/a	VJ5785
Run #2	I52397.D	10	12/27/17 17:07	MM	n/a	n/a	VI1530

**Purge Volume**

Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	50	ug/l	
71-43-2	Benzene	ND	2.0	ug/l	
108-86-1	Bromobenzene	ND	2.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	2.0	ug/l	
75-27-4	Bromodichloromethane	ND	2.0	ug/l	
75-25-2	Bromoform	ND	2.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	ug/l	
104-51-8	n-Butylbenzene	16.9	2.0	ug/l	
135-98-8	sec-Butylbenzene	16.4	2.0	ug/l	
98-06-6	tert-Butylbenzene	ND	2.0	ug/l	
75-15-0	Carbon Disulfide	ND	4.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	2.0	ug/l	
108-90-7	Chlorobenzene	ND	2.0	ug/l	
75-00-3	Chloroethane	ND	4.0	ug/l	
67-66-3	Chloroform	ND	2.0	ug/l	
95-49-8	o-Chlorotoluene	ND	2.0	ug/l	
106-43-4	p-Chlorotoluene	ND	2.0	ug/l	
124-48-1	Dibromochloromethane	ND	2.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	ug/l	
106-93-4	1,2-Dibromoethane	ND	4.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	4.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	2.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	2.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	2.0	ug/l	
75-34-3	1,1-Dichloroethane	4.3	2.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	2.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	28.0	2.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	2.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	2.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.22  
4

<b>Client Sample ID:</b>	SMW-30-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-22	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	2.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	2.0	ug/l	
100-41-4	Ethylbenzene	148	2.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	4.0	ug/l	
591-78-6	2-Hexanone	ND	20	ug/l	
98-82-8	Isopropylbenzene	52.6	2.0	ug/l	
99-87-6	p-Isopropyltoluene	8.1	2.0	ug/l	
74-83-9	Methyl Bromide	ND	4.0	ug/l	
74-87-3	Methyl Chloride	ND	4.0	ug/l	
74-95-3	Methylene Bromide	ND	4.0	ug/l	
75-09-2	Methylene Chloride	ND	10	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	10	ug/l	
91-20-3	Naphthalene	491 <sup>a</sup>	50	ug/l	
103-65-1	n-Propylbenzene	106	2.0	ug/l	
100-42-5	Styrene	ND	2.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.0	ug/l	
127-18-4	Tetrachloroethylene	ND	2.0	ug/l	
108-88-3	Toluene	18.5	2.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	4.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	4.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	2.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	2.0	ug/l	
79-01-6	Trichloroethylene	7.0	2.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	4.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	4.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	566 <sup>a</sup>	10	ug/l	
108-67-8	1,3,5-Trimethylbenzene	50.9	2.0	ug/l	
75-01-4	Vinyl Chloride	16.1	2.0	ug/l	
	m,p-Xylene	57.3	4.0	ug/l	
95-47-6	o-Xylene	6.8	2.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	98%	83-118%
17060-07-0	1,2-Dichloroethane-D4	110%	102%	79-125%
2037-26-5	Toluene-D8	96%	99%	85-112%
460-00-4	4-Bromofluorobenzene	93%	99%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-30-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-22	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.22  
4

**Report of Analysis**

Page 1 of 2

4.23

4

**Client Sample ID:** SMW-22-20171214**Lab Sample ID:** FA50344-23**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988463.D	1	12/26/17 17:23	MM	n/a	n/a	VJ5785
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	19.6	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	12.5	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	1.2	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	66.2	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.23

4

<b>Client Sample ID:</b>	SMW-22-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-23	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	36.3	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	7.7	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	4.4	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	1.4	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	49.4	1.0	ug/l	
	m,p-Xylene	30.8	2.0	ug/l	
95-47-6	o-Xylene	10.4	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	107%		79-125%
2037-26-5	Toluene-D8	94%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.24  
4

<b>Client Sample ID:</b>	FB-02-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-24	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988457.D	1	12/26/17 15:01	MM	n/a	n/a	VJ5785
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	FB-02-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-24	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	112%		79-125%
2037-26-5	Toluene-D8	99%		85-112%
460-00-4	4-Bromofluorobenzene	96%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.24  
4

**Report of Analysis**

Page 1 of 1

4.25

4

**Client Sample ID:** EXW-3A-20171214**Lab Sample ID:** FA50344-25**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B BY SIM**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	Z49986.D	1	12/29/17 16:30	MM	n/a	n/a	VZ1876
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	1.2	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	94%		74-125%
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2037-26-5	Toluene-D8	105%		88-111%
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(a) Sample re-analyzed beyond hold time due to QC failure in original analysis; reported results are considered minimum values.

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.25

4

**Client Sample ID:** EXW-3A-20171214**Lab Sample ID:** FA50344-25**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988465.D	1	12/26/17 18:10	MM	n/a	n/a	VJ5785
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	3.6	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.25

4

<b>Client Sample ID:</b>	EXW-3A-20171214	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-25	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	111%		79-125%
2037-26-5	Toluene-D8	97%		85-112%
460-00-4	4-Bromofluorobenzene	97%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.26  
4**Client Sample ID:** EXW-3A-20171214-D2**Lab Sample ID:** FA50344-26**Date Sampled:** 12/14/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988464.D	1	12/26/17 17:47	MM	n/a	n/a	VJ5785
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	3.6	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	EXW-3A-20171214-D2	<b>Date Sampled:</b>	12/14/17
<b>Lab Sample ID:</b>	FA50344-26	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	109%		79-125%
2037-26-5	Toluene-D8	96%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.27

4

**Client Sample ID:** EXW-02-20171215-D3**Lab Sample ID:** FA50344-27**Date Sampled:** 12/15/17**Matrix:** AQ - Ground Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988515.D	2.5	12/28/17 15:01	SP	n/a	n/a	VJ5787
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	63	ug/l	
71-43-2	Benzene	3.2	2.5	ug/l	
108-86-1	Bromobenzene	ND	2.5	ug/l	
74-97-5	Bromo(chloromethane)	ND	2.5	ug/l	
75-27-4	Bromodichloromethane	ND	2.5	ug/l	
75-25-2	Bromoform	ND	2.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	13	ug/l	
104-51-8	n-Butylbenzene	ND	2.5	ug/l	
135-98-8	sec-Butylbenzene	ND	2.5	ug/l	
98-06-6	tert-Butylbenzene	ND	2.5	ug/l	
75-15-0	Carbon Disulfide	ND	5.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	2.5	ug/l	
108-90-7	Chlorobenzene	ND	2.5	ug/l	
75-00-3	Chloroethane	14.5	5.0	ug/l	
67-66-3	Chloroform	ND	2.5	ug/l	
95-49-8	o-Chlorotoluene	ND	2.5	ug/l	
106-43-4	p-Chlorotoluene	ND	2.5	ug/l	
124-48-1	Dibromo(chloromethane)	ND	2.5	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	13	ug/l	
106-93-4	1,2-Dibromoethane	ND	5.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	2.8	2.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	2.5	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	2.5	ug/l	
75-34-3	1,1-Dichloroethane	20.8	2.5	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.5	ug/l	
75-35-4	1,1-Dichloroethylene	12.2	2.5	ug/l	
156-59-2	cis-1,2-Dichloroethylene	183	2.5	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.5	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.5	ug/l	
142-28-9	1,3-Dichloropropane	ND	2.5	ug/l	
594-20-7	2,2-Dichloropropane	ND	2.5	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

4.27

4

<b>Client Sample ID:</b>	EXW-02-20171215-D3	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-27	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	2.5	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.5	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	2.5	ug/l	
100-41-4	Ethylbenzene	ND	2.5	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	ug/l	
591-78-6	2-Hexanone	ND	25	ug/l	
98-82-8	Isopropylbenzene	ND	2.5	ug/l	
99-87-6	p-Isopropyltoluene	ND	2.5	ug/l	
74-83-9	Methyl Bromide	ND	5.0	ug/l	
74-87-3	Methyl Chloride	ND	5.0	ug/l	
74-95-3	Methylene Bromide	ND	5.0	ug/l	
75-09-2	Methylene Chloride	ND	13	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	13	ug/l	
91-20-3	Naphthalene	ND	13	ug/l	
103-65-1	n-Propylbenzene	ND	2.5	ug/l	
100-42-5	Styrene	ND	2.5	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.5	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.5	ug/l	
127-18-4	Tetrachloroethylene	ND	2.5	ug/l	
108-88-3	Toluene	ND	2.5	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/l	
71-55-6	1,1,1-Trichloroethane	5.3	2.5	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	2.5	ug/l	
79-01-6	Trichloroethylene	3.9	2.5	ug/l	
75-69-4	Trichlorofluoromethane	ND	5.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ug/l	
75-01-4	Vinyl Chloride	33.9	2.5	ug/l	
	m,p-Xylene	ND	5.0	ug/l	
95-47-6	o-Xylene	3.5	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	111%		79-125%
2037-26-5	Toluene-D8	93%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.28

4

**Client Sample ID:** FB-03-20171215**Lab Sample ID:** FA50344-28**Date Sampled:** 12/15/17**Matrix:** AQ - Field Blank Water**Date Received:** 12/16/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988505.D	1	12/28/17 11:04	SP	n/a	n/a	VJ5787
Run #2							

**Purge Volume**

Run #1 5.0 ml

Run #2

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.28  
4

<b>Client Sample ID:</b>	FB-03-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-28	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Field Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	106%		79-125%
2037-26-5	Toluene-D8	97%		85-112%
460-00-4	4-Bromofluorobenzene	95%		83-118%

ND = Not detected

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J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

4.29

4

<b>Client Sample ID:</b>	EXW-02-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-29	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B BY SIM		

**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	Z49987.D	1	12/29/17 16:55	MM	n/a	n/a	VZ1876
Run #2							

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
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123-91-1	1,4-Dioxane	19.6	1.0	ug/l	
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<b>CAS No.</b>	<b>Surrogate Recoveries</b>	<b>Run# 1</b>	<b>Run# 2</b>	<b>Limits</b>
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17060-07-0	1,2-Dichloroethane-D4	93%		74-125%
2037-26-5	Toluene-D8	106%		88-111%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.29

4

<b>Client Sample ID:</b>	EXW-02-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-29	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988516.D	2.5	12/28/17 15:25	SP	n/a	n/a	VJ5787
Run #2							

	<b>Purge Volume</b>
Run #1	5.0 ml
Run #2	

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	63	ug/l	
71-43-2	Benzene	3.0	2.5	ug/l	
108-86-1	Bromobenzene	ND	2.5	ug/l	
74-97-5	Bromo(chloromethane)	ND	2.5	ug/l	
75-27-4	Bromodichloromethane	ND	2.5	ug/l	
75-25-2	Bromoform	ND	2.5	ug/l	
78-93-3	2-Butanone (MEK)	ND	13	ug/l	
104-51-8	n-Butylbenzene	ND	2.5	ug/l	
135-98-8	sec-Butylbenzene	ND	2.5	ug/l	
98-06-6	tert-Butylbenzene	ND	2.5	ug/l	
75-15-0	Carbon Disulfide	ND	5.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	2.5	ug/l	
108-90-7	Chlorobenzene	ND	2.5	ug/l	
75-00-3	Chloroethane	14.9	5.0	ug/l	
67-66-3	Chloroform	ND	2.5	ug/l	
95-49-8	o-Chlorotoluene	ND	2.5	ug/l	
106-43-4	p-Chlorotoluene	ND	2.5	ug/l	
124-48-1	Dibromo(chloromethane)	ND	2.5	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	13	ug/l	
106-93-4	1,2-Dibromoethane	ND	5.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/l	
95-50-1	1,2-Dichlorobenzene	2.9	2.5	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	2.5	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	2.5	ug/l	
75-34-3	1,1-Dichloroethane	21.3	2.5	ug/l	
107-06-2	1,2-Dichloroethane	ND	2.5	ug/l	
75-35-4	1,1-Dichloroethylene	12.5	2.5	ug/l	
156-59-2	cis-1,2-Dichloroethylene	179	2.5	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	2.5	ug/l	
78-87-5	1,2-Dichloropropane	ND	2.5	ug/l	
142-28-9	1,3-Dichloropropane	ND	2.5	ug/l	
594-20-7	2,2-Dichloropropane	ND	2.5	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	EXW-02-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-29	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	2.5	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	2.5	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	2.5	ug/l	
100-41-4	Ethylbenzene	ND	2.5	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	ug/l	
591-78-6	2-Hexanone	ND	25	ug/l	
98-82-8	Isopropylbenzene	ND	2.5	ug/l	
99-87-6	p-Isopropyltoluene	ND	2.5	ug/l	
74-83-9	Methyl Bromide	ND	5.0	ug/l	
74-87-3	Methyl Chloride	ND	5.0	ug/l	
74-95-3	Methylene Bromide	ND	5.0	ug/l	
75-09-2	Methylene Chloride	ND	13	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	13	ug/l	
91-20-3	Naphthalene	ND	13	ug/l	
103-65-1	n-Propylbenzene	ND	2.5	ug/l	
100-42-5	Styrene	ND	2.5	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	2.5	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	2.5	ug/l	
127-18-4	Tetrachloroethylene	ND	2.5	ug/l	
108-88-3	Toluene	ND	2.5	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/l	
71-55-6	1,1,1-Trichloroethane	4.9	2.5	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	2.5	ug/l	
79-01-6	Trichloroethylene	4.0	2.5	ug/l	
75-69-4	Trichlorofluoromethane	ND	5.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	5.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	2.5	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	2.5	ug/l	
75-01-4	Vinyl Chloride	34.2	2.5	ug/l	
	m,p-Xylene	ND	5.0	ug/l	
95-47-6	o-Xylene	3.5	2.5	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	109%		79-125%
2037-26-5	Toluene-D8	92%		85-112%
460-00-4	4-Bromofluorobenzene	94%		83-118%

ND = Not detected

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E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-12-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-30	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988517.D	200	12/28/17 15:48	SP	n/a	n/a	VJ5787
Run #2	P54756.D	1000	12/29/17 19:07	TD	n/a	n/a	VP2077
Run #3 <sup>a</sup>	P54775.D	5000	12/30/17 18:14	SP	n/a	n/a	VP2078

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml
Run #3	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	5000	ug/l	
71-43-2	Benzene	235	200	ug/l	
108-86-1	Bromobenzene	ND	200	ug/l	
74-97-5	Bromoform	ND	200	ug/l	
75-27-4	Bromochloromethane	ND	200	ug/l	
75-25-2	Bromodichloromethane	ND	200	ug/l	
78-93-3	2-Butanone (MEK)	ND	1000	ug/l	
104-51-8	n-Butylbenzene	ND	200	ug/l	
135-98-8	sec-Butylbenzene	ND	200	ug/l	
98-06-6	tert-Butylbenzene	ND	200	ug/l	
75-15-0	Carbon Disulfide	ND	400	ug/l	
56-23-5	Carbon Tetrachloride	ND	200	ug/l	
108-90-7	Chlorobenzene	ND	200	ug/l	
75-00-3	Chloroethane	1620	400	ug/l	
67-66-3	Chloroform	ND	200	ug/l	
95-49-8	o-Chlorotoluene	ND	200	ug/l	
106-43-4	p-Chlorotoluene	ND	200	ug/l	
124-48-1	Dibromochloromethane	ND	200	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	1000	ug/l	
106-93-4	1,2-Dibromoethane	ND	400	ug/l	
75-71-8	Dichlorodifluoromethane	ND	400	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	200	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	200	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	200	ug/l	
75-34-3	1,1-Dichloroethane	3300	200	ug/l	
107-06-2	1,2-Dichloroethane	ND	200	ug/l	
75-35-4	1,1-Dichloroethylene	997	200	ug/l	
156-59-2	cis-1,2-Dichloroethylene	40400 <sup>b</sup>	1000	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	200	ug/l	
78-87-5	1,2-Dichloropropane	ND	200	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-12-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-30	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
142-28-9	1,3-Dichloropropane	ND	200	ug/l	
594-20-7	2,2-Dichloropropane	ND	200	ug/l	
563-58-6	1,1-Dichloropropene	ND	200	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	200	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	200	ug/l	
100-41-4	Ethylbenzene	5930	200	ug/l	
87-68-3	Hexachlorobutadiene	ND	400	ug/l	
591-78-6	2-Hexanone	ND	2000	ug/l	
98-82-8	Isopropylbenzene	ND	200	ug/l	
99-87-6	p-Isopropyltoluene	ND	200	ug/l	
74-83-9	Methyl Bromide	ND	400	ug/l	
74-87-3	Methyl Chloride	ND	400	ug/l	
74-95-3	Methylene Bromide	ND	400	ug/l	
75-09-2	Methylene Chloride	ND	1000	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	1000	ug/l	
91-20-3	Naphthalene	ND	1000	ug/l	
103-65-1	n-Propylbenzene	ND	200	ug/l	
100-42-5	Styrene	ND	200	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	200	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	200	ug/l	
127-18-4	Tetrachloroethylene	ND	200	ug/l	
108-88-3	Toluene	91700 <sup>c</sup>	5000	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	400	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	400	ug/l	
71-55-6	1,1,1-Trichloroethane	1270	200	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	200	ug/l	
79-01-6	Trichloroethylene	306	200	ug/l	
75-69-4	Trichlorofluoromethane	ND	400	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	400	ug/l	
95-63-6	1,2,4-Trimethylbenzene	254	200	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	200	ug/l	
75-01-4	Vinyl Chloride	3310	200	ug/l	
	m,p-Xylene	12000	400	ug/l	
95-47-6	o-Xylene	3480	200	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
1868-53-7	Dibromofluoromethane	101%	93%	94%	83-118%
17060-07-0	1,2-Dichloroethane-D4	106%	86%	88%	79-125%
2037-26-5	Toluene-D8	97%	100%	101%	85-112%

ND = Not detected

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E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	PZ-12-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-30	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Run# 3	Limits
460-00-4	4-Bromofluorobenzene	94%	98%	96%	83-118%

- (a) Sample contained significant headspace. Sample re-analyzed beyond hold time; reported results are considered minimum values.  
 (b) Result is from Run# 2  
 (c) Result is from Run# 3

ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

4.30  
4

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-11-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-31	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988518.D	500	12/28/17 16:12	SP	n/a	n/a	VJ5787
Run #2	P54757.D	1000	12/29/17 19:31	TD	n/a	n/a	VP2077

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	13000	ug/l	
71-43-2	Benzene	ND	500	ug/l	
108-86-1	Bromobenzene	ND	500	ug/l	
74-97-5	Bromo(chloromethane)	ND	500	ug/l	
75-27-4	Bromodichloromethane	ND	500	ug/l	
75-25-2	Bromoform	ND	500	ug/l	
78-93-3	2-Butanone (MEK)	ND	2500	ug/l	
104-51-8	n-Butylbenzene	ND	500	ug/l	
135-98-8	sec-Butylbenzene	ND	500	ug/l	
98-06-6	tert-Butylbenzene	ND	500	ug/l	
75-15-0	Carbon Disulfide	ND	1000	ug/l	
56-23-5	Carbon Tetrachloride	ND	500	ug/l	
108-90-7	Chlorobenzene	ND	500	ug/l	
75-00-3	Chloroethane	ND	1000	ug/l	
67-66-3	Chloroform	ND	500	ug/l	
95-49-8	o-Chlorotoluene	ND	500	ug/l	
106-43-4	p-Chlorotoluene	ND	500	ug/l	
124-48-1	Dibromochloromethane	ND	500	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2500	ug/l	
106-93-4	1,2-Dibromoethane	ND	1000	ug/l	
75-71-8	Dichlorodifluoromethane	ND	1000	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	500	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	500	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	500	ug/l	
75-34-3	1,1-Dichloroethane	1260	500	ug/l	
107-06-2	1,2-Dichloroethane	ND	500	ug/l	
75-35-4	1,1-Dichloroethylene	1300	500	ug/l	
156-59-2	cis-1,2-Dichloroethylene	39800	500	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	500	ug/l	
78-87-5	1,2-Dichloropropane	ND	500	ug/l	
142-28-9	1,3-Dichloropropane	ND	500	ug/l	
594-20-7	2,2-Dichloropropane	ND	500	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	PZ-11-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-31	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	500	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	500	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	500	ug/l	
100-41-4	Ethylbenzene	5150	500	ug/l	
87-68-3	Hexachlorobutadiene	ND	1000	ug/l	
591-78-6	2-Hexanone	ND	5000	ug/l	
98-82-8	Isopropylbenzene	ND	500	ug/l	
99-87-6	p-Isopropyltoluene	ND	500	ug/l	
74-83-9	Methyl Bromide	ND	1000	ug/l	
74-87-3	Methyl Chloride	ND	1000	ug/l	
74-95-3	Methylene Bromide	ND	1000	ug/l	
75-09-2	Methylene Chloride	ND	2500	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	2500	ug/l	
91-20-3	Naphthalene	ND	2500	ug/l	
103-65-1	n-Propylbenzene	ND	500	ug/l	
100-42-5	Styrene	550	500	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	500	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	500	ug/l	
127-18-4	Tetrachloroethylene	ND	500	ug/l	
108-88-3	Toluene	69300 <sup>a</sup>	1000	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1000	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1000	ug/l	
71-55-6	1,1,1-Trichloroethane	3170	500	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	500	ug/l	
79-01-6	Trichloroethylene	ND	500	ug/l	
75-69-4	Trichlorofluoromethane	ND	1000	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	1000	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	500	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	500	ug/l	
75-01-4	Vinyl Chloride	2420	500	ug/l	
	m,p-Xylene	10400	1000	ug/l	
95-47-6	o-Xylene	2770	500	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	94%	83-118%
17060-07-0	1,2-Dichloroethane-D4	109%	85%	79-125%
2037-26-5	Toluene-D8	97%	101%	85-112%
460-00-4	4-Bromofluorobenzene	93%	95%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	PZ-11-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-31	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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(a) Result is from Run# 2

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

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**Report of Analysis**

4.32

4

<b>Client Sample ID:</b>	SMW-08-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-32	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	M0100658.D	1	12/30/17 11:29	WV	n/a	n/a	VM4328
Run #2 <sup>b</sup>	J0988521.D	5	12/28/17 17:23	SP	n/a	n/a	VJ5787

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>Units</b>	<b>Q</b>
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromo(chloromethane)	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromo(chloromethane)	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	1.6	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	4.4	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**4.32  
4

<b>Client Sample ID:</b>	SMW-08-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-32	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	2.2	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	1.2	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	95%	108%	79-125%
2037-26-5	Toluene-D8	91%	96%	85-112%
460-00-4	4-Bromofluorobenzene	101%	95%	83-118%

ND = Not detected

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 3 of 3

<b>Client Sample ID:</b>	SMW-08-20171215	<b>Date Sampled:</b>	12/15/17
<b>Lab Sample ID:</b>	FA50344-32	<b>Date Received:</b>	12/16/17
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	Units	Q
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- (a) Sample re-analyzed beyond hold time; reported results are considered minimum values.  
 (b) Confirmation run.

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ND = Not detected  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

**Misc. Forms****5****Custody Documents and Other Forms**

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Includes the following where applicable:

- Chain of Custody



Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/889-3715 Fax 425/889-4133

Univar Chain of Custody/Laboratory Analysis Request Form

Page 1 of 3

Bill to: Mark Metcalf  
17425 NE Union Hill Rd  
Redmond, Wa 98052

Lab Name: Accutest

Address:

Telephone:

FL. FA50344

Univar Project Site: Yeon Site, Portland, OR

Contractor Project Manager:

Brendan Robinson

Firm: ERM  
Address: 1011 SW 5th Ave Ste 1010  
Portland OR 97204  
Tel: 503-488-5282

Sampler's Signature: 82

SAMPLE I.D. DATE TIME LAB I.D. MATRIX

NUMBER OF CONTAINERS

8 VOC  
8260 D10X  
314

1	Trip -1	11/13/17		H2O	2	X							
2	SMW-11-20171213		0738		4	X	X						
3	PZ-06-20171213		0821		6	X	X						
4	SMW-03-20171213		0916		3	X							
5	SMW-40-20171213		1001		3	X							
6	DMW-08-20171213		1004		3	X							
7	SMW-21-20171213		1056		3	X							
8	FB-01-20171213		1112		3	X							
9	SMW-09-20171213		1132		3	X							
10	SMW-26-20171213		1207		6	X	X						
11	SMW-12-20171213		1237		3	X							
12	SMW-12-20171213-01		1237		3	X							
13	SMW-04-20171213		1317		3	X							
14	SMW-06-20171213	✓	1350		6	X	X						

Relinquished by/date: 82 11/19/17

Received by/date: Fed EX 1

Relinquished by/date: Fed EX 1 945

Received by/date: 12/14/17

Relinquished by/date: /

Received by/date: /

Relinquished by/date: /



Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/889-3715 Fax 425/889-4133

Univar Chain of Custody/Laboratory Analysis Request Form

Page 2 of 3

Bill to: Mark Metcalf  
17425 NE Union Hill Rd  
Redmond, Wa 98052

Lab Name: AccuTEST

Address:

Telephone:

FAX **FA50344**

Univar Project Site: Yeon Site, Portland, OR

Contractor Project Manager:

Brendan Robinson

Firm: ERM

Address: 1011 SW 5th Ave STE 1010  
Portland OR 97204

Tel: 503-488-5282

Sampler's Signature: BR

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	8/26/07 VOC	Diox
15 SUW-07-20171213	12/13/07	1428		410	3	X	
16 PZ-08-20170214	12/4/07	0729		410	3	X	
17 PZ-07-20171214		0810			3	X	
18 PZ-04-20171214		0859			3	X	
19 SUW-38-20171214		0929			4	X	X
20 SUW-37-20171214		0958			6	X	X
21 SUW-39-20171214		1037			3	X	
22 SUW-30-20171214		1302			3	X	
23 SUW-32-20171214		1346			3	X	
24 FB-02-20171214		1320			3	X	
25 EXW-3a-20171214		1343			6	X	X
26 EXW-3a-20171214-02		1343			3	X	
27 EXW-02-20171215-03	12/5/07	0821		410	3	X	
28 FB-03-20171215	12/5/07	0750			3	X	

Relinquished by/date: BR 12/15/07

Received by/date: Fed EX 1

Relinquished by/date: Fed EX 1 943

Received by/date: BR 12/16/07

Relinquished by/date: /

Received by/date: /



# SGS Accutest Sample Receipt Summary

Job Number: FA50344 Client: ERM Project: YEON SITE  
 Date / Time Received: 12/16/2017 9:45:00 AM Delivery Method: FED EX Airbill #'s: 1002241132260003281100812188498198

Therm ID: IR 1;	Therm CF: 0.4;	# of Coolers: 1
Cooler Temps (Raw Measured) °C:	Cooler 1: (0.8);	
Cooler Temps (Corrected) °C:	Cooler 1: (1.2);	

<u>Cooler Information</u>		<u>Y</u> or <u>N</u>	<u>Sample Information</u>	<u>Y</u> or <u>N</u>	<u>N/A</u>
1. Custody Seals Present		<input checked="" type="checkbox"/> <input type="checkbox"/>	1. Sample labels present on bottles	<input checked="" type="checkbox"/> <input type="checkbox"/>	
2. Custody Seals Intact		<input checked="" type="checkbox"/> <input type="checkbox"/>	2. Samples preserved properly	<input checked="" type="checkbox"/> <input type="checkbox"/>	
3. Temp criteria achieved		<input checked="" type="checkbox"/> <input type="checkbox"/>	3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/> <input type="checkbox"/>	
4. Cooler temp verification		IR Gun	4. Condition of sample	Intact	
5. Cooler media		Ice (Bag)	5. Sample recvd within HT	<input checked="" type="checkbox"/> <input type="checkbox"/>	
<u>Trip Blank Information</u>		<u>Y</u> or <u>N</u>	<u>N/A</u>	6. Dates/Times/IDs on COC match Sample Label	<input type="checkbox"/> <input checked="" type="checkbox"/>
1. Trip Blank present / cooler		<input checked="" type="checkbox"/> <input type="checkbox"/>		7. VOCs have headspace	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC		<input checked="" type="checkbox"/> <input type="checkbox"/>		8. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>
		<u>W</u> or <u>S</u>	<u>N/A</u>	9. Compositing instructions clear	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
3. Type Of TB Received		<input checked="" type="checkbox"/> <input type="checkbox"/>		10. VOA Soil Kits/Jars received past 48hrs?	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
				11. % Solids Jar received?	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>
				12. Residual Chlorine Present?	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

## Misc. Information

Number of Enclos: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_ Number of 5035 Field Kits: \_\_\_\_\_ Number of Lab Filtered Metals: \_\_\_\_\_  
 Test Strip Lot #: pH 0-3 230315 pH 10-12 219813A Other: (Specify) \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments THE DIOX VIALS FOR SAMPLE #19 ID LABEL READS SMW-28 @929. 2- VIALS FOR SAMPLE #28 READS FB-02 @750

SM001  
Rev. Date 05/24/17

Technician: SHAYLAP Date: 12/16/2017 9:45:00 A Reviewer: SP Date: 12/16/2017

5.1

5

**FA50344: Chain of Custody**  
**Page 4 of 4**

**MS Volatiles****QC Data Summaries**

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ1876-MB	Z49975.D	1	12/29/17	MM	n/a	n/a	VZ1876

The QC reported here applies to the following samples:

Method: SW846 8260B BY SIM

FA50344-2, FA50344-3, FA50344-10, FA50344-14, FA50344-19, FA50344-20, FA50344-25, FA50344-29

CAS No.	Compound	Result	RL	Units	Q
123-91-1	1,4-Dioxane	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
17060-07-0	1,2-Dichloroethane-D4	89%
2037-26-5	Toluene-D8	104%      74-125% 88-111%



## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2071-MB	P54567.D	1	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2071-MB	P54567.D	1	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	91% 83-118%
17060-07-0	1,2-Dichloroethane-D4	86% 79-125%
2037-26-5	Toluene-D8	102% 85-112%
460-00-4	4-Bromofluorobenzene	97% 83-118%

## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5783-MB	J0988385.D	1	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5783-MB	J0988385.D	1	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	100% 83-118%
17060-07-0	1,2-Dichloroethane-D4	108% 79-125%
2037-26-5	Toluene-D8	98% 85-112%
460-00-4	4-Bromofluorobenzene	95% 83-118%

## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1526-MB	I52299.D	1	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1526-MB	I52299.D	1	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	0.40	2.0	ug/l	J
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	0.40	2.0	ug/l	J
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97%
17060-07-0	1,2-Dichloroethane-D4	106%
2037-26-5	Toluene-D8	99%
460-00-4	4-Bromofluorobenzene	97%

## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5785-MB	J0988445.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5785-MB	J0988445.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	102%
17060-07-0	1,2-Dichloroethane-D4	110%
2037-26-5	Toluene-D8	96%
460-00-4	4-Bromofluorobenzene	96%
		83-118%
		79-125%
		85-112%
		83-118%

## Method Blank Summary

Page 1 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4322-MB	M0100539.D	1	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

6.1.6  
6

## Method Blank Summary

Page 2 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4322-MB	M0100539.D	1	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	95%	79-125%
2037-26-5	Toluene-D8	97%	85-112%
460-00-4	4-Bromofluorobenzene	102%	83-118%

## Method Blank Summary

Page 3 of 3

Job Number: FA50344

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4322-MB	M0100539.D	1	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method:

FA50344-13, FA50344-14

CAS No.	Tentatively Identified Compounds	R.T.	Est. Conc.	Units	Q
	Total TIC, Volatile <sup>a</sup>		0	ug/l	

(a) No TICs detected.

6.1.6  
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## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1530-MB	I52392.D	1	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

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## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1530-MB	I52392.D	1	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	0.46	2.0	ug/l	J
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits	
1868-53-7	Dibromofluoromethane	96%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%
2037-26-5	Toluene-D8	99%	85-112%
460-00-4	4-Bromofluorobenzene	100%	83-118%

## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5787-MB	J0988502.D	1	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

6.1.8  
6

## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5787-MB	J0988502.D	1	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	103% 83-118%
17060-07-0	1,2-Dichloroethane-D4	106% 79-125%
2037-26-5	Toluene-D8	98% 85-112%
460-00-4	4-Bromofluorobenzene	96% 83-118%

## Method Blank Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5789-MB	J0988534.D	1	12/29/17	MM	n/a	n/a	VJ5789

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-19

CAS No.	Compound	Result	RL	Units	Q
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99%
17060-07-0	1,2-Dichloroethane-D4	107%
2037-26-5	Toluene-D8	96%
460-00-4	4-Bromofluorobenzene	95%

6.1.9  
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## Method Blank Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2077-MB	P54739.D	1	12/29/17	TD	n/a	n/a	VP2077

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-30, FA50344-31

CAS No.	Compound	Result	RL	Units	Q
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	92%
17060-07-0	1,2-Dichloroethane-D4	85%
2037-26-5	Toluene-D8	101%
460-00-4	4-Bromofluorobenzene	98%

6.1.10

## Method Blank Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4328-MB	M0100654.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

CAS No.	Compound	Result	RL	Units	Q
67-64-1	Acetone	ND	25	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
108-86-1	Bromobenzene	ND	1.0	ug/l	
74-97-5	Bromochloromethane	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	2.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	

6.1.11  
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## Method Blank Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4328-MB	M0100654.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

CAS No.	Compound	Result	RL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	ug/l	
591-78-6	2-Hexanone	ND	10	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	ug/l	
74-83-9	Methyl Bromide	ND	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	ug/l	
74-95-3	Methylene Bromide	ND	2.0	ug/l	
75-09-2	Methylene Chloride	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/l	
91-20-3	Naphthalene	ND	5.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	ug/l	
	m,p-Xylene	ND	2.0	ug/l	
95-47-6	o-Xylene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 83-118%
17060-07-0	1,2-Dichloroethane-D4	97% 79-125%
2037-26-5	Toluene-D8	93% 85-112%
460-00-4	4-Bromofluorobenzene	103% 83-118%

6.1.11

## Method Blank Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2078-MB	P54766.D	1	12/30/17	SP	n/a	n/a	VP2078

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-30

CAS No.	Compound	Result	RL	Units	Q
108-88-3	Toluene	ND	1.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	95% 83-118%
17060-07-0	1,2-Dichloroethane-D4	89% 79-125%
2037-26-5	Toluene-D8	102% 85-112%
460-00-4	4-Bromofluorobenzene	94% 83-118%

6.1.12  
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## Method Blank Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2083-MB	P54901.D	1	01/08/18	AJ	n/a	n/a	VP2083

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-6, FA50344-7

CAS No.	Compound	Result	RL	Units	Q
75-00-3	Chloroethane	ND	2.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
540-59-0	1,2-Dichloroethene (total)	ND	2.0	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	98%
17060-07-0	1,2-Dichloroethane-D4	101%
2037-26-5	Toluene-D8	101%
460-00-4	4-Bromofluorobenzene	99%

**Blank Spike Summary**

Job Number: FA50344

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ1876-BS	Z49973.D	1	12/29/17	MM	n/a	n/a	VZ1876

**The QC reported here applies to the following samples:****Method:** SW846 8260B BY SIM

FA50344-2, FA50344-3, FA50344-10, FA50344-14, FA50344-19, FA50344-20, FA50344-25, FA50344-29

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
123-91-1	1,4-Dioxane	20	18.4	92	65-121

CAS No.	Surrogate Recoveries	BSP	Limits
17060-07-0	1,2-Dichloroethane-D4	89%	74-125%
2037-26-5	Toluene-D8	104%	88-111%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5783-BS	J0988383.D	1	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	121	97	50-147
71-43-2	Benzene	25	26.3	105	81-122
108-86-1	Bromobenzene	25	27.6	110	80-121
74-97-5	Bromochloromethane	25	25.4	102	76-123
75-27-4	Bromodichloromethane	25	27.0	108	79-123
75-25-2	Bromoform	25	22.1	88	66-123
78-93-3	2-Butanone (MEK)	125	125	100	56-143
104-51-8	n-Butylbenzene	25	28.4	114	79-126
135-98-8	sec-Butylbenzene	25	28.4	114	83-133
98-06-6	tert-Butylbenzene	25	26.9	108	80-133
75-15-0	Carbon Disulfide	25	28.2	113	66-148
56-23-5	Carbon Tetrachloride	25	27.1	108	76-136
108-90-7	Chlorobenzene	25	26.3	105	82-124
75-00-3	Chloroethane	25	31.7	127	62-144
67-66-3	Chloroform	25	26.1	104	80-124
95-49-8	o-Chlorotoluene	25	27.2	109	81-127
106-43-4	p-Chlorotoluene	25	27.2	109	83-130
124-48-1	Dibromochloromethane	25	24.5	98	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	23.6	94	64-123
106-93-4	1,2-Dibromoethane	25	26.8	107	75-120
75-71-8	Dichlorodifluoromethane	25	30.9	124	42-167
95-50-1	1,2-Dichlorobenzene	25	26.4	106	82-124
541-73-1	1,3-Dichlorobenzene	25	27.2	109	84-125
106-46-7	1,4-Dichlorobenzene	25	26.1	104	78-120
75-34-3	1,1-Dichloroethane	25	28.0	112	81-122
107-06-2	1,2-Dichloroethane	25	26.2	105	75-125
75-35-4	1,1-Dichloroethylene	25	28.1	112	78-137
156-59-2	cis-1,2-Dichloroethylene	25	26.9	108	78-120
156-60-5	trans-1,2-Dichloroethylene	25	27.8	111	76-127
78-87-5	1,2-Dichloropropane	25	25.9	104	76-124
142-28-9	1,3-Dichloropropane	25	25.0	100	80-118
594-20-7	2,2-Dichloropropane	25	28.3	113	74-139
563-58-6	1,1-Dichloropropene	25	27.0	108	79-131
10061-01-5	cis-1,3-Dichloropropene	25	25.3	101	75-118
10061-02-6	trans-1,3-Dichloropropene	25	26.1	104	80-120
100-41-4	Ethylbenzene	25	26.6	106	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5783-BS	J0988383.D	1	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	27.2	109	75-142
591-78-6	2-Hexanone	125	119	95	61-129
98-82-8	Isopropylbenzene	25	28.5	114	83-132
99-87-6	p-Isopropyltoluene	25	28.9	116	79-130
74-83-9	Methyl Bromide	25	23.1	92	59-143
74-87-3	Methyl Chloride	25	27.1	108	50-159
74-95-3	Methylene Bromide	25	27.5	110	78-119
75-09-2	Methylene Chloride	25	27.2	109	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	123	98	66-122
91-20-3	Naphthalene	25	25.2	101	63-132
103-65-1	n-Propylbenzene	25	27.7	111	82-133
100-42-5	Styrene	25	27.4	110	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	26.9	108	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	26.6	106	72-120
127-18-4	Tetrachloroethylene	25	26.7	107	76-135
108-88-3	Toluene	25	26.8	107	80-120
87-61-6	1,2,3-Trichlorobenzene	25	27.1	108	68-131
120-82-1	1,2,4-Trichlorobenzene	25	26.5	106	73-129
71-55-6	1,1,1-Trichloroethane	25	26.6	106	75-130
79-00-5	1,1,2-Trichloroethane	25	26.3	105	76-119
79-01-6	Trichloroethylene	25	26.3	105	81-126
75-69-4	Trichlorofluoromethane	25	31.4	126	71-156
96-18-4	1,2,3-Trichloropropane	25	23.9	96	77-120
95-63-6	1,2,4-Trimethylbenzene	25	26.9	108	79-120
108-67-8	1,3,5-Trimethylbenzene	25	28.1	112	79-120
75-01-4	Vinyl Chloride	25	28.4	114	69-159
	m,p-Xylene	50	54.2	108	79-126
95-47-6	o-Xylene	25	26.3	105	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	100%	79-125%
2037-26-5	Toluene-D8	101%	85-112%
460-00-4	4-Bromofluorobenzene	100%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2071-BS	P54566.D	1	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	103	82	50-147
71-43-2	Benzene	25	27.0	108	81-122
108-86-1	Bromobenzene	25	25.3	101	80-121
74-97-5	Bromochloromethane	25	22.8	91	76-123
75-27-4	Bromodichloromethane	25	23.5	94	79-123
75-25-2	Bromoform	25	24.4	98	66-123
78-93-3	2-Butanone (MEK)	125	122	98	56-143
104-51-8	n-Butylbenzene	25	28.0	112	79-126
135-98-8	sec-Butylbenzene	25	27.9	112	83-133
98-06-6	tert-Butylbenzene	25	25.3	101	80-133
75-15-0	Carbon Disulfide	25	28.6	114	66-148
56-23-5	Carbon Tetrachloride	25	23.6	94	76-136
108-90-7	Chlorobenzene	25	26.4	106	82-124
75-00-3	Chloroethane	25	29.4	118	62-144
67-66-3	Chloroform	25	23.6	94	80-124
95-49-8	o-Chlorotoluene	25	26.7	107	81-127
106-43-4	p-Chlorotoluene	25	26.8	107	83-130
124-48-1	Dibromochloromethane	25	24.0	96	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	22.3	89	64-123
106-93-4	1,2-Dibromoethane	25	24.9	100	75-120
75-71-8	Dichlorodifluoromethane	25	20.5	82	42-167
95-50-1	1,2-Dichlorobenzene	25	25.4	102	82-124
541-73-1	1,3-Dichlorobenzene	25	26.3	105	84-125
106-46-7	1,4-Dichlorobenzene	25	25.2	101	78-120
75-34-3	1,1-Dichloroethane	25	27.3	109	81-122
107-06-2	1,2-Dichloroethane	25	22.1	88	75-125
75-35-4	1,1-Dichloroethylene	25	26.3	105	78-137
156-59-2	cis-1,2-Dichloroethylene	25	25.8	103	78-120
156-60-5	trans-1,2-Dichloroethylene	25	26.3	105	76-127
78-87-5	1,2-Dichloropropane	25	27.1	108	76-124
142-28-9	1,3-Dichloropropane	25	24.6	98	80-118
594-20-7	2,2-Dichloropropane	25	24.5	98	74-139
563-58-6	1,1-Dichloropropene	25	24.0	96	79-131
10061-01-5	cis-1,3-Dichloropropene	25	24.1	96	75-118
10061-02-6	trans-1,3-Dichloropropene	25	25.7	103	80-120
100-41-4	Ethylbenzene	25	26.5	106	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2071-BS	P54566.D	1	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	22.3	89	75-142
591-78-6	2-Hexanone	125	123	98	61-129
98-82-8	Isopropylbenzene	25	27.5	110	83-132
99-87-6	p-Isopropyltoluene	25	27.4	110	79-130
74-83-9	Methyl Bromide	25	21.8	87	59-143
74-87-3	Methyl Chloride	25	19.9	80	50-159
74-95-3	Methylene Bromide	25	23.9	96	78-119
75-09-2	Methylene Chloride	25	24.3	97	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	125	100	66-122
91-20-3	Naphthalene	25	24.1	96	63-132
103-65-1	n-Propylbenzene	25	27.7	111	82-133
100-42-5	Styrene	25	27.0	108	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	25.7	103	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	27.8	111	72-120
127-18-4	Tetrachloroethylene	25	28.3	113	76-135
108-88-3	Toluene	25	26.2	105	80-120
87-61-6	1,2,3-Trichlorobenzene	25	23.0	92	68-131
120-82-1	1,2,4-Trichlorobenzene	25	23.0	92	73-129
71-55-6	1,1,1-Trichloroethane	25	21.9	88	75-130
79-00-5	1,1,2-Trichloroethane	25	26.6	106	76-119
79-01-6	Trichloroethylene	25	25.6	102	81-126
75-69-4	Trichlorofluoromethane	25	24.6	98	71-156
96-18-4	1,2,3-Trichloropropane	25	23.7	95	77-120
95-63-6	1,2,4-Trimethylbenzene	25	26.3	105	79-120
108-67-8	1,3,5-Trimethylbenzene	25	27.7	111	79-120
75-01-4	Vinyl Chloride	25	26.4	106	69-159
	m,p-Xylene	50	53.3	107	79-126
95-47-6	o-Xylene	25	25.9	104	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	94%	83-118%
17060-07-0	1,2-Dichloroethane-D4	89%	79-125%
2037-26-5	Toluene-D8	102%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

\* = Outside of Control Limits.

6.2.3  
6

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1526-BS	I52298.D	1	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	136	109	50-147
71-43-2	Benzene	25	27.8	111	81-122
108-86-1	Bromobenzene	25	26.3	105	80-121
74-97-5	Bromochloromethane	25	27.2	109	76-123
75-27-4	Bromodichloromethane	25	27.7	111	79-123
75-25-2	Bromoform	25	26.0	104	66-123
78-93-3	2-Butanone (MEK)	125	146	117	56-143
104-51-8	n-Butylbenzene	25	26.8	107	79-126
135-98-8	sec-Butylbenzene	25	28.2	113	83-133
98-06-6	tert-Butylbenzene	25	27.3	109	80-133
75-15-0	Carbon Disulfide	25	28.7	115	66-148
56-23-5	Carbon Tetrachloride	25	27.6	110	76-136
108-90-7	Chlorobenzene	25	26.5	106	82-124
75-00-3	Chloroethane	25	34.4	138	62-144
67-66-3	Chloroform	25	27.4	110	80-124
95-49-8	o-Chlorotoluene	25	27.5	110	81-127
106-43-4	p-Chlorotoluene	25	27.2	109	83-130
124-48-1	Dibromochloromethane	25	26.1	104	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	27.5	110	64-123
106-93-4	1,2-Dibromoethane	25	28.8	115	75-120
75-71-8	Dichlorodifluoromethane	25	23.0	92	42-167
95-50-1	1,2-Dichlorobenzene	25	26.1	104	82-124
541-73-1	1,3-Dichlorobenzene	25	26.9	108	84-125
106-46-7	1,4-Dichlorobenzene	25	26.0	104	78-120
75-34-3	1,1-Dichloroethane	25	29.8	119	81-122
107-06-2	1,2-Dichloroethane	25	27.9	112	75-125
75-35-4	1,1-Dichloroethylene	25	30.3	121	78-137
156-59-2	cis-1,2-Dichloroethylene	25	28.5	114	78-120
156-60-5	trans-1,2-Dichloroethylene	25	29.8	119	76-127
78-87-5	1,2-Dichloropropane	25	27.4	110	76-124
142-28-9	1,3-Dichloropropane	25	26.7	107	80-118
594-20-7	2,2-Dichloropropane	25	31.5	126	74-139
563-58-6	1,1-Dichloropropene	25	28.3	113	79-131
10061-01-5	cis-1,3-Dichloropropene	25	24.6	98	75-118
10061-02-6	trans-1,3-Dichloropropene	25	26.9	108	80-120
100-41-4	Ethylbenzene	25	27.4	110	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1526-BS	I52298.D	1	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	26.4	106	75-142
591-78-6	2-Hexanone	125	146	117	61-129
98-82-8	Isopropylbenzene	25	29.0	116	83-132
99-87-6	p-Isopropyltoluene	25	28.1	112	79-130
74-83-9	Methyl Bromide	25	26.4	106	59-143
74-87-3	Methyl Chloride	25	19.0	76	50-159
74-95-3	Methylene Bromide	25	28.3	113	78-119
75-09-2	Methylene Chloride	25	27.7	111	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	140	112	66-122
91-20-3	Naphthalene	25	29.0	116	63-132
103-65-1	n-Propylbenzene	25	27.9	112	82-133
100-42-5	Styrene	25	26.7	107	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	28.5	114	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	29.9	120	72-120
127-18-4	Tetrachloroethylene	25	32.3	129	76-135
108-88-3	Toluene	25	26.9	108	80-120
87-61-6	1,2,3-Trichlorobenzene	25	26.2	105	68-131
120-82-1	1,2,4-Trichlorobenzene	25	26.2	105	73-129
71-55-6	1,1,1-Trichloroethane	25	27.8	111	75-130
79-00-5	1,1,2-Trichloroethane	25	28.7	115	76-119
79-01-6	Trichloroethylene	25	28.6	114	81-126
75-69-4	Trichlorofluoromethane	25	27.3	109	71-156
96-18-4	1,2,3-Trichloropropane	25	28.6	114	77-120
95-63-6	1,2,4-Trimethylbenzene	25	26.8	107	79-120
108-67-8	1,3,5-Trimethylbenzene	25	28.2	113	79-120
75-01-4	Vinyl Chloride	25	24.0	96	69-159
	m,p-Xylene	50	55.6	111	79-126
95-47-6	o-Xylene	25	26.9	108	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	79-125%
2037-26-5	Toluene-D8	101%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5785-BS	J0988444.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	138	110	50-147
71-43-2	Benzene	25	25.1	100	81-122
108-86-1	Bromobenzene	25	26.1	104	80-121
74-97-5	Bromochloromethane	25	25.4	102	76-123
75-27-4	Bromodichloromethane	25	26.0	104	79-123
75-25-2	Bromoform	25	21.9	88	66-123
78-93-3	2-Butanone (MEK)	125	131	105	56-143
104-51-8	n-Butylbenzene	25	26.7	107	79-126
135-98-8	sec-Butylbenzene	25	26.8	107	83-133
98-06-6	tert-Butylbenzene	25	25.9	104	80-133
75-15-0	Carbon Disulfide	25	27.0	108	66-148
56-23-5	Carbon Tetrachloride	25	26.3	105	76-136
108-90-7	Chlorobenzene	25	25.3	101	82-124
75-00-3	Chloroethane	25	27.5	110	62-144
67-66-3	Chloroform	25	25.2	101	80-124
95-49-8	o-Chlorotoluene	25	25.6	102	81-127
106-43-4	p-Chlorotoluene	25	25.9	104	83-130
124-48-1	Dibromochloromethane	25	23.3	93	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	22.9	92	64-123
106-93-4	1,2-Dibromoethane	25	26.1	104	75-120
75-71-8	Dichlorodifluoromethane	25	28.8	115	42-167
95-50-1	1,2-Dichlorobenzene	25	25.1	100	82-124
541-73-1	1,3-Dichlorobenzene	25	25.9	104	84-125
106-46-7	1,4-Dichlorobenzene	25	25.0	100	78-120
75-34-3	1,1-Dichloroethane	25	27.1	108	81-122
107-06-2	1,2-Dichloroethane	25	25.2	101	75-125
75-35-4	1,1-Dichloroethylene	25	27.1	108	78-137
156-59-2	cis-1,2-Dichloroethylene	25	26.8	107	78-120
156-60-5	trans-1,2-Dichloroethylene	25	27.0	108	76-127
78-87-5	1,2-Dichloropropane	25	25.2	101	76-124
142-28-9	1,3-Dichloropropane	25	24.1	96	80-118
594-20-7	2,2-Dichloropropane	25	27.8	111	74-139
563-58-6	1,1-Dichloropropene	25	25.9	104	79-131
10061-01-5	cis-1,3-Dichloropropene	25	24.0	96	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.6	98	80-120
100-41-4	Ethylbenzene	25	25.4	102	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5785-BS	J0988444.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	27.1	108	75-142
591-78-6	2-Hexanone	125	131	105	61-129
98-82-8	Isopropylbenzene	25	27.2	109	83-132
99-87-6	p-Isopropyltoluene	25	27.8	111	79-130
74-83-9	Methyl Bromide	25	23.4	94	59-143
74-87-3	Methyl Chloride	25	26.4	106	50-159
74-95-3	Methylene Bromide	25	25.9	104	78-119
75-09-2	Methylene Chloride	25	26.9	108	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	130	104	66-122
91-20-3	Naphthalene	25	25.6	102	63-132
103-65-1	n-Propylbenzene	25	26.3	105	82-133
100-42-5	Styrene	25	27.0	108	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	26.2	105	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	26.2	105	72-120
127-18-4	Tetrachloroethylene	25	25.0	100	76-135
108-88-3	Toluene	25	26.0	104	80-120
87-61-6	1,2,3-Trichlorobenzene	25	25.1	100	68-131
120-82-1	1,2,4-Trichlorobenzene	25	25.3	101	73-129
71-55-6	1,1,1-Trichloroethane	25	25.6	102	75-130
79-00-5	1,1,2-Trichloroethane	25	25.0	100	76-119
79-01-6	Trichloroethylene	25	26.2	105	81-126
75-69-4	Trichlorofluoromethane	25	29.4	118	71-156
96-18-4	1,2,3-Trichloropropane	25	24.5	98	77-120
95-63-6	1,2,4-Trimethylbenzene	25	25.5	102	79-120
108-67-8	1,3,5-Trimethylbenzene	25	27.1	108	79-120
75-01-4	Vinyl Chloride	25	26.4	106	69-159
	m,p-Xylene	50	52.5	105	79-126
95-47-6	o-Xylene	25	25.3	101	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	101%	79-125%
2037-26-5	Toluene-D8	98%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4322-BS	M0100538.D	1	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	145	116	50-147
71-43-2	Benzene	25	24.4	98	81-122
108-86-1	Bromobenzene	25	23.7	95	80-121
74-97-5	Bromochloromethane	25	24.9	100	76-123
75-27-4	Bromodichloromethane	25	25.7	103	79-123
75-25-2	Bromoform	25	24.4	98	66-123
78-93-3	2-Butanone (MEK)	125	138	110	56-143
104-51-8	n-Butylbenzene	25	23.6	94	79-126
135-98-8	sec-Butylbenzene	25	24.7	99	83-133
98-06-6	tert-Butylbenzene	25	22.9	92	80-133
75-15-0	Carbon Disulfide	25	23.6	94	66-148
56-23-5	Carbon Tetrachloride	25	24.6	98	76-136
108-90-7	Chlorobenzene	25	23.1	92	82-124
75-00-3	Chloroethane	25	29.9	120	62-144
67-66-3	Chloroform	25	23.5	94	80-124
95-49-8	o-Chlorotoluene	25	23.4	94	81-127
106-43-4	p-Chlorotoluene	25	23.4	94	83-130
124-48-1	Dibromochloromethane	25	25.1	100	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	21.5	86	64-123
106-93-4	1,2-Dibromoethane	25	25.0	100	75-120
75-71-8	Dichlorodifluoromethane	25	11.3	45	42-167
95-50-1	1,2-Dichlorobenzene	25	23.0	92	82-124
541-73-1	1,3-Dichlorobenzene	25	23.7	95	84-125
106-46-7	1,4-Dichlorobenzene	25	22.9	92	78-120
75-34-3	1,1-Dichloroethane	25	25.6	102	81-122
107-06-2	1,2-Dichloroethane	25	24.5	98	75-125
75-35-4	1,1-Dichloroethylene	25	24.2	97	78-137
156-59-2	cis-1,2-Dichloroethylene	25	25.0	100	78-120
156-60-5	trans-1,2-Dichloroethylene	25	25.1	100	76-127
78-87-5	1,2-Dichloropropane	25	24.4	98	76-124
142-28-9	1,3-Dichloropropane	25	21.8	87	80-118
594-20-7	2,2-Dichloropropane	25	25.4	102	74-139
563-58-6	1,1-Dichloropropene	25	24.0	96	79-131
10061-01-5	cis-1,3-Dichloropropene	25	23.8	95	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.1	96	80-120
100-41-4	Ethylbenzene	25	23.2	93	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4322-BS	M0100538.D	1	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	23.2	93	75-142
591-78-6	2-Hexanone	125	131	105	61-129
98-82-8	Isopropylbenzene	25	25.3	101	83-132
99-87-6	p-Isopropyltoluene	25	24.8	99	79-130
74-83-9	Methyl Bromide	25	27.2	109	59-143
74-87-3	Methyl Chloride	25	26.0	104	50-159
74-95-3	Methylene Bromide	25	25.3	101	78-119
75-09-2	Methylene Chloride	25	24.7	99	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	131	105	66-122
91-20-3	Naphthalene	25	23.7	95	63-132
103-65-1	n-Propylbenzene	25	22.9	92	82-133
100-42-5	Styrene	25	24.3	97	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	24.6	98	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	23.3	93	72-120
108-88-3	Toluene	25	23.3	93	80-120
87-61-6	1,2,3-Trichlorobenzene	25	22.9	92	68-131
120-82-1	1,2,4-Trichlorobenzene	25	22.9	92	73-129
71-55-6	1,1,1-Trichloroethane	25	23.5	94	75-130
79-00-5	1,1,2-Trichloroethane	25	23.2	93	76-119
79-01-6	Trichloroethylene	25	25.1	100	81-126
75-69-4	Trichlorofluoromethane	25	29.4	118	71-156
96-18-4	1,2,3-Trichloropropane	25	21.8	87	77-120
95-63-6	1,2,4-Trimethylbenzene	25	23.2	93	79-120
108-67-8	1,3,5-Trimethylbenzene	25	24.2	97	79-120
75-01-4	Vinyl Chloride	25	28.1	112	69-159
	m,p-Xylene	50	46.8	94	79-126
95-47-6	o-Xylene	25	23.2	93	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	104%	83-118%
17060-07-0	1,2-Dichloroethane-D4	96%	79-125%
2037-26-5	Toluene-D8	97%	85-112%
460-00-4	4-Bromofluorobenzene	101%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1530-BS	I52391.D	1	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	110	88	50-147
71-43-2	Benzene	25	23.9	96	81-122
108-86-1	Bromobenzene	25	24.2	97	80-121
74-97-5	Bromochloromethane	25	23.6	94	76-123
75-27-4	Bromodichloromethane	25	25.0	100	79-123
75-25-2	Bromoform	25	22.0	88	66-123
78-93-3	2-Butanone (MEK)	125	120	96	56-143
104-51-8	n-Butylbenzene	25	22.7	91	79-126
135-98-8	sec-Butylbenzene	25	26.1	104	83-133
98-06-6	tert-Butylbenzene	25	24.9	100	80-133
75-15-0	Carbon Disulfide	25	24.0	96	66-148
56-23-5	Carbon Tetrachloride	25	26.1	104	76-136
108-90-7	Chlorobenzene	25	24.2	97	82-124
75-00-3	Chloroethane	25	25.8	103	62-144
67-66-3	Chloroform	25	24.4	98	80-124
95-49-8	o-Chlorotoluene	25	24.9	100	81-127
106-43-4	p-Chlorotoluene	25	25.0	100	83-130
124-48-1	Dibromochloromethane	25	22.4	90	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	20.9	84	64-123
106-93-4	1,2-Dibromoethane	25	24.7	99	75-120
75-71-8	Dichlorodifluoromethane	25	26.0	104	42-167
95-50-1	1,2-Dichlorobenzene	25	23.9	96	82-124
541-73-1	1,3-Dichlorobenzene	25	24.9	100	84-125
106-46-7	1,4-Dichlorobenzene	25	23.6	94	78-120
75-34-3	1,1-Dichloroethane	25	25.4	102	81-122
107-06-2	1,2-Dichloroethane	25	23.6	94	75-125
75-35-4	1,1-Dichloroethylene	25	24.7	99	78-137
156-59-2	cis-1,2-Dichloroethylene	25	24.8	99	78-120
156-60-5	trans-1,2-Dichloroethylene	25	25.0	100	76-127
78-87-5	1,2-Dichloropropane	25	23.7	95	76-124
142-28-9	1,3-Dichloropropane	25	22.7	91	80-118
594-20-7	2,2-Dichloropropane	25	26.2	105	74-139
563-58-6	1,1-Dichloropropene	25	24.9	100	79-131
10061-01-5	cis-1,3-Dichloropropene	25	20.7	83	75-118
10061-02-6	trans-1,3-Dichloropropene	25	22.6	90	80-120
100-41-4	Ethylbenzene	25	24.7	99	81-121

\* = Outside of Control Limits.

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI1530-BS	I52391.D	1	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	26.1	104	75-142
591-78-6	2-Hexanone	125	124	99	61-129
98-82-8	Isopropylbenzene	25	27.6	110	83-132
99-87-6	p-Isopropyltoluene	25	23.5	94	79-130
74-83-9	Methyl Bromide	25	26.5	106	59-143
74-87-3	Methyl Chloride	25	26.8	107	50-159
74-95-3	Methylene Bromide	25	23.7	95	78-119
75-09-2	Methylene Chloride	25	22.6	90	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	129	103	66-122
91-20-3	Naphthalene	25	22.1	88	63-132
103-65-1	n-Propylbenzene	25	24.9	100	82-133
100-42-5	Styrene	25	22.5	90	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	26.1	104	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	24.2	97	72-120
127-18-4	Tetrachloroethylene	25	25.9	104	76-135
108-88-3	Toluene	25	24.5	98	80-120
87-61-6	1,2,3-Trichlorobenzene	25	24.5	98	68-131
120-82-1	1,2,4-Trichlorobenzene	25	24.7	99	73-129
79-00-5	1,1,2-Trichloroethane	25	24.3	97	76-119
79-01-6	Trichloroethylene	25	24.7	99	81-126
75-69-4	Trichlorofluoromethane	25	29.6	118	71-156
96-18-4	1,2,3-Trichloropropane	25	23.7	95	77-120
95-63-6	1,2,4-Trimethylbenzene	25	21.9	88	79-120
108-67-8	1,3,5-Trimethylbenzene	25	26.0	104	79-120
75-01-4	Vinyl Chloride	25	24.1	96	69-159
	m,p-Xylene	50	51.1	102	79-126
95-47-6	o-Xylene	25	25.3	101	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	79-125%
2037-26-5	Toluene-D8	101%	85-112%
460-00-4	4-Bromofluorobenzene	100%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5787-BS	J0988501.D	1	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	132	106	50-147
71-43-2	Benzene	25	26.9	108	81-122
108-86-1	Bromobenzene	25	27.8	111	80-121
74-97-5	Bromochloromethane	25	26.7	107	76-123
75-27-4	Bromodichloromethane	25	28.2	113	79-123
75-25-2	Bromoform	25	23.1	92	66-123
78-93-3	2-Butanone (MEK)	125	134	107	56-143
104-51-8	n-Butylbenzene	25	28.4	114	79-126
135-98-8	sec-Butylbenzene	25	28.0	112	83-133
98-06-6	tert-Butylbenzene	25	26.8	107	80-133
75-15-0	Carbon Disulfide	25	28.4	114	66-148
56-23-5	Carbon Tetrachloride	25	27.6	110	76-136
108-90-7	Chlorobenzene	25	26.4	106	82-124
75-00-3	Chloroethane	25	27.5	110	62-144
67-66-3	Chloroform	25	26.9	108	80-124
95-49-8	o-Chlorotoluene	25	27.1	108	81-127
106-43-4	p-Chlorotoluene	25	27.6	110	83-130
124-48-1	Dibromochloromethane	25	25.5	102	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	23.2	93	64-123
106-93-4	1,2-Dibromoethane	25	27.5	110	75-120
75-71-8	Dichlorodifluoromethane	25	29.7	119	42-167
95-50-1	1,2-Dichlorobenzene	25	27.2	109	82-124
541-73-1	1,3-Dichlorobenzene	25	27.8	111	84-125
106-46-7	1,4-Dichlorobenzene	25	26.3	105	78-120
75-34-3	1,1-Dichloroethane	25	28.2	113	81-122
107-06-2	1,2-Dichloroethane	25	26.9	108	75-125
75-35-4	1,1-Dichloroethylene	25	28.7	115	78-137
156-59-2	cis-1,2-Dichloroethylene	25	27.4	110	78-120
156-60-5	trans-1,2-Dichloroethylene	25	28.8	115	76-127
78-87-5	1,2-Dichloropropane	25	27.1	108	76-124
142-28-9	1,3-Dichloropropane	25	25.1	100	80-118
594-20-7	2,2-Dichloropropane	25	28.7	115	74-139
563-58-6	1,1-Dichloropropene	25	28.0	112	79-131
10061-01-5	cis-1,3-Dichloropropene	25	25.8	103	75-118
10061-02-6	trans-1,3-Dichloropropene	25	25.3	101	80-120
100-41-4	Ethylbenzene	25	26.4	106	81-121

\* = Outside of Control Limits.

6.2.8  
6

## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5787-BS	J0988501.D	1	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	28.7	115	75-142
591-78-6	2-Hexanone	125	127	102	61-129
98-82-8	Isopropylbenzene	25	29.2	117	83-132
99-87-6	p-Isopropyltoluene	25	29.2	117	79-130
74-83-9	Methyl Bromide	25	21.6	86	59-143
74-87-3	Methyl Chloride	25	27.3	109	50-159
74-95-3	Methylene Bromide	25	28.0	112	78-119
75-09-2	Methylene Chloride	25	28.1	112	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	128	102	66-122
91-20-3	Naphthalene	25	26.7	107	63-132
103-65-1	n-Propylbenzene	25	27.7	111	82-133
100-42-5	Styrene	25	28.0	112	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	28.5	114	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	26.3	105	72-120
127-18-4	Tetrachloroethylene	25	27.0	108	76-135
108-88-3	Toluene	25	26.7	107	80-120
87-61-6	1,2,3-Trichlorobenzene	25	28.2	113	68-131
120-82-1	1,2,4-Trichlorobenzene	25	27.7	111	73-129
71-55-6	1,1,1-Trichloroethane	25	27.0	108	75-130
79-00-5	1,1,2-Trichloroethane	25	26.0	104	76-119
79-01-6	Trichloroethylene	25	28.6	114	81-126
75-69-4	Trichlorofluoromethane	25	29.4	118	71-156
96-18-4	1,2,3-Trichloropropane	25	24.6	98	77-120
95-63-6	1,2,4-Trimethylbenzene	25	27.1	108	79-120
108-67-8	1,3,5-Trimethylbenzene	25	28.2	113	79-120
75-01-4	Vinyl Chloride	25	27.7	111	69-159
	m,p-Xylene	50	54.9	110	79-126
95-47-6	o-Xylene	25	27.0	108	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	100%	79-125%
2037-26-5	Toluene-D8	97%	85-112%
460-00-4	4-Bromofluorobenzene	97%	83-118%

\* = Outside of Control Limits.

6.2.8  
6

## Blank Spike Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5789-BS	J0988533.D	1	12/29/17	MM	n/a	n/a	VJ5789

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-19

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-55-6	1,1,1-Trichloroethane	25	27.7	111	75-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%
2037-26-5	Toluene-D8	97%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

\* = Outside of Control Limits.

**Blank Spike Summary**

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2077-BS	P54738.D	1	12/29/17	TD	n/a	n/a	VP2077

**The QC reported here applies to the following samples:****Method:** SW846 8260B

FA50344-30, FA50344-31

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
156-59-2	cis-1,2-Dichloroethylene	25	27.1	108	78-120
108-88-3	Toluene	25	27.0	108	80-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	92%	83-118%
17060-07-0	1,2-Dichloroethane-D4	85%	79-125%
2037-26-5	Toluene-D8	100%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

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\* = Outside of Control Limits.

6.2.10

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## Blank Spike Summary

Page 1 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4328-BS	M0100653.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	146	117	50-147
71-43-2	Benzene	25	27.1	108	81-122
108-86-1	Bromobenzene	25	24.0	96	80-121
74-97-5	Bromochloromethane	25	28.8	115	76-123
75-27-4	Bromodichloromethane	25	27.4	110	79-123
75-25-2	Bromoform	25	26.3	105	66-123
78-93-3	2-Butanone (MEK)	125	151	121	56-143
104-51-8	n-Butylbenzene	25	24.7	99	79-126
135-98-8	sec-Butylbenzene	25	25.3	101	83-133
98-06-6	tert-Butylbenzene	25	23.4	94	80-133
75-15-0	Carbon Disulfide	25	26.3	105	66-148
56-23-5	Carbon Tetrachloride	25	27.7	111	76-136
108-90-7	Chlorobenzene	25	24.4	98	82-124
75-00-3	Chloroethane	25	30.6	122	62-144
67-66-3	Chloroform	25	26.6	106	80-124
95-49-8	o-Chlorotoluene	25	23.9	96	81-127
106-43-4	p-Chlorotoluene	25	24.0	96	83-130
124-48-1	Dibromochloromethane	25	26.5	106	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	21.1	84	64-123
106-93-4	1,2-Dibromoethane	25	25.9	104	75-120
75-71-8	Dichlorodifluoromethane	25	29.3	117	42-167
95-50-1	1,2-Dichlorobenzene	25	24.1	96	82-124
541-73-1	1,3-Dichlorobenzene	25	24.9	100	84-125
106-46-7	1,4-Dichlorobenzene	25	24.0	96	78-120
75-34-3	1,1-Dichloroethane	25	28.1	112	81-122
107-06-2	1,2-Dichloroethane	25	26.9	108	75-125
75-35-4	1,1-Dichloroethylene	25	27.1	108	78-137
156-59-2	cis-1,2-Dichloroethylene	25	28.3	113	78-120
156-60-5	trans-1,2-Dichloroethylene	25	27.5	110	76-127
78-87-5	1,2-Dichloropropane	25	27.1	108	76-124
142-28-9	1,3-Dichloropropane	25	23.2	93	80-118
594-20-7	2,2-Dichloropropane	25	27.7	111	74-139
563-58-6	1,1-Dichloropropene	25	26.4	106	79-131
10061-01-5	cis-1,3-Dichloropropene	25	26.4	106	75-118
10061-02-6	trans-1,3-Dichloropropene	25	25.7	103	80-120
100-41-4	Ethylbenzene	25	25.1	100	81-121

\* = Outside of Control Limits.

6.2.11  
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## Blank Spike Summary

Page 2 of 2

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VM4328-BS	M0100653.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	24.8	99	75-142
591-78-6	2-Hexanone	125	136	109	61-129
98-82-8	Isopropylbenzene	25	27.0	108	83-132
99-87-6	p-Isopropyltoluene	25	25.4	102	79-130
74-83-9	Methyl Bromide	25	30.0	120	59-143
74-87-3	Methyl Chloride	25	27.5	110	50-159
74-95-3	Methylene Bromide	25	27.9	112	78-119
75-09-2	Methylene Chloride	25	27.3	109	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	138	110	66-122
91-20-3	Naphthalene	25	25.1	100	63-132
103-65-1	n-Propylbenzene	25	24.0	96	82-133
100-42-5	Styrene	25	25.7	103	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	26.7	107	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	24.5	98	72-120
127-18-4	Tetrachloroethylene	25	26.5	106	76-135
108-88-3	Toluene	25	24.5	98	80-120
87-61-6	1,2,3-Trichlorobenzene	25	24.2	97	68-131
120-82-1	1,2,4-Trichlorobenzene	25	24.7	99	73-129
71-55-6	1,1,1-Trichloroethane	25	25.8	103	75-130
79-00-5	1,1,2-Trichloroethane	25	24.4	98	76-119
79-01-6	Trichloroethylene	25	28.2	113	81-126
75-69-4	Trichlorofluoromethane	25	31.7	127	71-156
96-18-4	1,2,3-Trichloropropane	25	23.1	92	77-120
95-63-6	1,2,4-Trimethylbenzene	25	24.6	98	79-120
108-67-8	1,3,5-Trimethylbenzene	25	24.8	99	79-120
75-01-4	Vinyl Chloride	25	29.5	118	69-159
	m,p-Xylene	50	50.2	100	79-126
95-47-6	o-Xylene	25	24.9	100	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	106%	83-118%
17060-07-0	1,2-Dichloroethane-D4	97%	79-125%
2037-26-5	Toluene-D8	93%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

\* = Outside of Control Limits.

6.2.11  
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## Blank Spike Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2078-BS	P54765.D	1	12/30/17	SP	n/a	n/a	VP2078

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-30

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
108-88-3	Toluene	25	26.9	108	80-120

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	93%	83-118%
17060-07-0	1,2-Dichloroethane-D4	90%	79-125%
2037-26-5	Toluene-D8	100%	85-112%
460-00-4	4-Bromofluorobenzene	94%	83-118%

\* = Outside of Control Limits.

6.2.12  
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**Blank Spike Summary**

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VP2083-BS	P54902.D	1	01/08/18	AJ	n/a	n/a	VP2083

**The QC reported here applies to the following samples:****Method:** SW846 8260B

FA50344-6, FA50344-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-00-3	Chloroethane	25	26.4	106	62-144
156-59-2	cis-1,2-Dichloroethylene	25	25.4	102	78-120
540-59-0	1,2-Dichloroethene (total)	50	52.4	105	77-122

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	79-125%
2037-26-5	Toluene-D8	102%	85-112%
460-00-4	4-Bromofluorobenzene	99%	83-118%

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\* = Outside of Control Limits.

6.2.13

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# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50545-1MS	Z49988.D	1	12/29/17	MM	n/a	n/a	VZ1876
FA50545-1MSD	Z49989.D	1	12/29/17	MM	n/a	n/a	VZ1876
FA50545-1	Z49977.D	1	12/29/17	MM	n/a	n/a	VZ1876

The QC reported here applies to the following samples:

Method: SW846 8260B BY SIM

FA50344-2, FA50344-3, FA50344-10, FA50344-14, FA50344-19, FA50344-20, FA50344-25, FA50344-29

CAS No.	Compound	FA50545-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
123-91-1	1,4-Dioxane	0.59	J	20	19.3	94	20	17.1	83	12	65-121/27

CAS No.	Surrogate Recoveries	MS	MSD	FA50545-1	Limits
17060-07-0	1,2-Dichloroethane-D4	91%	93%	91%	74-125%
2037-26-5	Toluene-D8	108%	107%	108%	88-111%

\* = Outside of Control Limits.

6.3.1

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-4MS	P54588.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4MSD	P54589.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4 a	P54580.D	25	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	FA50381-4 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	1950	3130	4300	75	3130	4340	76	1	50-147/21
71-43-2	Benzene	25 U	625	626	100	625	635	102	1	81-122/14
108-86-1	Bromobenzene	25 U	625	574	92	625	600	96	4	80-121/14
74-97-5	Bromochloromethane	25 U	625	506	81	625	525	84	4	76-123/14
75-27-4	Bromodichloromethane	25 U	625	538	86	625	565	90	5	79-123/19
75-25-2	Bromoform	25 U	625	498	80	625	541	87	8	66-123/21
78-93-3	2-Butanone (MEK)	7510	3130	10500	96	3130	10400	92	1	56-143/18
104-51-8	n-Butylbenzene	25 U	625	640	102	625	659	105	3	79-126/16
135-98-8	sec-Butylbenzene	25 U	625	650	104	625	683	109	5	83-133/16
98-06-6	tert-Butylbenzene	25 U	625	580	93	625	612	98	5	80-133/16
75-15-0	Carbon Disulfide	50 U	625	619	99	625	652	104	5	66-148/23
56-23-5	Carbon Tetrachloride	25 U	625	507	81	625	541	87	6	76-136/23
108-90-7	Chlorobenzene	25 U	625	599	96	625	620	99	3	82-124/14
75-00-3	Chloroethane	50 U	625	706	113	625	753	120	6	62-144/20
67-66-3	Chloroform	25 U	625	531	85	625	546	87	3	80-124/15
95-49-8	o-Chlorotoluene	25 U	625	620	99	625	650	104	5	81-127/15
106-43-4	p-Chlorotoluene	25 U	625	621	99	625	646	103	4	83-130/15
124-48-1	Dibromochloromethane	25 U	625	511	82	625	564	90	10	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	130 U	625	509	81	625	534	85	5	64-123/18
106-93-4	1,2-Dibromoethane	50 U	625	540	86	625	564	90	4	75-120/13
75-71-8	Dichlorodifluoromethane	50 U	625	154	25*	625	483	77	103*	42-167/19
95-50-1	1,2-Dichlorobenzene	25 U	625	569	91	625	587	94	3	82-124/14
541-73-1	1,3-Dichlorobenzene	25 U	625	589	94	625	614	98	4	84-125/14
106-46-7	1,4-Dichlorobenzene	25 U	625	572	92	625	596	95	4	78-120/15
75-34-3	1,1-Dichloroethane	25 U	625	607	97	625	626	100	3	81-122/15
107-06-2	1,2-Dichloroethane	25 U	625	504	81	625	520	83	3	75-125/14
75-35-4	1,1-Dichloroethylene	25 U	625	570	91	625	612	98	7	78-137/18
156-59-2	cis-1,2-Dichloroethylene	9.2 J	625	571	90	625	604	95	6	78-120/15
156-60-5	trans-1,2-Dichloroethylene	25 U	625	555	89	625	594	95	7	76-127/17
78-87-5	1,2-Dichloropropane	25 U	625	592	95	625	622	100	5	76-124/14
142-28-9	1,3-Dichloropropane	25 U	625	534	85	625	577	92	8	80-118/13
594-20-7	2,2-Dichloropropane	25 U	625	467	75	625	497	80	6	74-139/17
563-58-6	1,1-Dichloropropene	25 U	625	519	83	625	547	88	5	79-131/16
10061-01-5	cis-1,3-Dichloropropene	25 U	625	525	84	625	552	88	5	75-118/23
10061-02-6	trans-1,3-Dichloropropene	25 U	625	566	91	625	598	96	5	80-120/22
100-41-4	Ethylbenzene	25 U	625	607	97	625	639	102	5	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-4MS	P54588.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4MSD	P54589.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4 <sup>a</sup>	P54580.D	25	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

CAS No.	Compound	FA50381-4 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
87-68-3	Hexachlorobutadiene	50 U	625	463	74*	625	495	79	7	75-142/19
591-78-6	2-Hexanone	250 U	3130	3420	109	3130	3380	108	1	61-129/18
98-82-8	Isopropylbenzene	25 U	625	623	100	625	658	105	5	83-132/15
99-87-6	p-Isopropyltoluene	25 U	625	633	101	625	652	104	3	79-130/16
74-83-9	Methyl Bromide	50 U	625	521	83	625	540	86	4	59-143/19
74-87-3	Methyl Chloride	50 U	625	411	66	625	468	75	13	50-159/19
74-95-3	Methylene Bromide	50 U	625	530	85	625	553	88	4	78-119/14
75-09-2	Methylene Chloride	130 U	625	546	87	625	558	89	2	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	130 U	3130	3290	105	3130	3300	106	0	66-122/16
91-20-3	Naphthalene	130 U	625	527	84	625	566	91	7	63-132/25
103-65-1	n-Propylbenzene	25 U	625	660	106	625	681	109	3	82-133/15
100-42-5	Styrene	25 U	625	597	96	625	636	102	6	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	25 U	625	563	90	625	598	96	6	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	25 U	625	653	104	625	667	107	2	72-120/14
127-18-4	Tetrachloroethylene	25 U	625	589	94	625	637	102	8	76-135/16
108-88-3	Toluene	25 U	625	589	94	625	625	100	6	80-120/14
87-61-6	1,2,3-Trichlorobenzene	50 U	625	501	80	625	520	83	4	68-131/25
120-82-1	1,2,4-Trichlorobenzene	50 U	625	494	79	625	524	84	6	73-129/20
71-55-6	1,1,1-Trichloroethane	25 U	625	466	75	625	501	80	7	75-130/16
79-00-5	1,1,2-Trichloroethane	25 U	625	595	95	625	623	100	5	76-119/14
79-01-6	Trichloroethylene	25 U	625	570	91	625	592	95	4	81-126/15
75-69-4	Trichlorofluoromethane	50 U	625	555	89	625	619	99	11	71-156/21
96-18-4	1,2,3-Trichloropropane	50 U	625	570	91	625	581	93	2	77-120/16
95-63-6	1,2,4-Trimethylbenzene	25 U	625	612	98	625	635	102	4	79-120/18
108-67-8	1,3,5-Trimethylbenzene	25 U	625	647	104	625	675	108	4	79-120/19
75-01-4	Vinyl Chloride	131	625	673	87	625	764	101	13	69-159/18
	m,p-Xylene	50 U	1250	1210	97	1250	1290	103	6	79-126/15
95-47-6	o-Xylene	25 U	625	572	92	625	605	97	6	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50381-4	Limits
1868-53-7	Dibromofluoromethane	90%	89%	90%	83-118%
17060-07-0	1,2-Dichloroethane-D4	89%	89%	84%	79-125%
2037-26-5	Toluene-D8	99%	101%	104%	85-112%
460-00-4	4-Bromofluorobenzene	92%	93%	96%	83-118%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-4MS	P54588.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4MSD	P54589.D	25	12/22/17	AJ	n/a	n/a	VP2071
FA50381-4 a	P54580.D	25	12/22/17	AJ	n/a	n/a	VP2071

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-1, FA50344-2, FA50344-3, FA50344-4, FA50344-5

(a) Confirmation run.

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\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50455-6MS	J0988406.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6MSD	J0988407.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6 <sup>a</sup>	J0988397.D	100	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	FA50455-6 ug/l	Spike Q	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	2500 U	12500	12200	98	12500	12900	103	6	50-147/21
71-43-2	Benzene	100 U	2500	2640	106	2500	2700	108	2	81-122/14
108-86-1	Bromobenzene	100 U	2500	2610	104	2500	2700	108	3	80-121/14
74-97-5	Bromochloromethane	100 U	2500	2570	103	2500	2710	108	5	76-123/14
75-27-4	Bromodichloromethane	100 U	2500	2640	106	2500	2630	105	0	79-123/19
75-25-2	Bromoform	100 U	2500	1920	77	2500	1990	80	4	66-123/21
78-93-3	2-Butanone (MEK)	500 U	12500	12700	102	12500	12500	100	2	56-143/18
104-51-8	n-Butylbenzene	100 U	2500	2710	108	2500	2740	110	1	79-126/16
135-98-8	sec-Butylbenzene	100 U	2500	2710	108	2500	2750	110	1	83-133/16
98-06-6	tert-Butylbenzene	100 U	2500	2590	104	2500	2680	107	3	80-133/16
75-15-0	Carbon Disulfide	200 U	2500	2750	110	2500	2860	114	4	66-148/23
56-23-5	Carbon Tetrachloride	100 U	2500	2670	107	2500	2680	107	0	76-136/23
108-90-7	Chlorobenzene	100 U	2500	2660	106	2500	2670	107	0	82-124/14
75-00-3	Chloroethane	200 U	2500	2980	119	2500	3030	121	2	62-144/20
67-66-3	Chloroform	100 U	2500	2580	103	2500	2690	108	4	80-124/15
95-49-8	o-Chlorotoluene	100 U	2500	2630	105	2500	2660	106	1	81-127/15
106-43-4	p-Chlorotoluene	100 U	2500	2620	105	2500	2650	106	1	83-130/15
124-48-1	Dibromochloromethane	100 U	2500	2250	90	2500	2250	90	0	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	500 U	2500	2060	82	2500	2210	88	7	64-123/18
106-93-4	1,2-Dibromoethane	200 U	2500	2650	106	2500	2640	106	0	75-120/13
75-71-8	Dichlorodifluoromethane	200 U	2500	2640	106	2500	2730	109	3	42-167/19
95-50-1	1,2-Dichlorobenzene	100 U	2500	2590	104	2500	2610	104	1	82-124/14
541-73-1	1,3-Dichlorobenzene	100 U	2500	2620	105	2500	2690	108	3	84-125/14
106-46-7	1,4-Dichlorobenzene	100 U	2500	2540	102	2500	2610	104	3	78-120/15
75-34-3	1,1-Dichloroethane	100 U	2500	2790	112	2500	2910	116	4	81-122/15
107-06-2	1,2-Dichloroethane	100 U	2500	2670	107	2500	2660	106	0	75-125/14
75-35-4	1,1-Dichloroethylene	100 U	2500	2700	108	2500	2810	112	4	78-137/18
156-59-2	cis-1,2-Dichloroethylene	3580	2500	5940	94	2500	6320	110	6	78-120/15
156-60-5	trans-1,2-Dichloroethylene	173	2500	2930	110	2500	3010	113	3	76-127/17
78-87-5	1,2-Dichloropropane	100 U	2500	2530	101	2500	2600	104	3	76-124/14
142-28-9	1,3-Dichloropropane	100 U	2500	2460	98	2500	2480	99	1	80-118/13
594-20-7	2,2-Dichloropropane	100 U	2500	2420	97	2500	2440	98	1	74-139/17
563-58-6	1,1-Dichloropropene	100 U	2500	2570	103	2500	2670	107	4	79-131/16
10061-01-5	cis-1,3-Dichloropropene	100 U	2500	2190	88	2500	2320	93	6	75-118/23
10061-02-6	trans-1,3-Dichloropropene	100 U	2500	2290	92	2500	2350	94	3	80-120/22
100-41-4	Ethylbenzene	100 U	2500	2630	105	2500	2660	106	1	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50455-6MS	J0988406.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6MSD	J0988407.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6 <sup>a</sup>	J0988397.D	100	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-13, FA50344-14, FA50344-15

CAS No.	Compound	FA50455-6		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	200	U	2500	2630	105	2500	2690	108	2	75-142/19
591-78-6	2-Hexanone	1000	U	12500	13000	104	12500	12600	101	3	61-129/18
98-82-8	Isopropylbenzene	100	U	2500	2800	112	2500	2870	115	2	83-132/15
99-87-6	p-Isopropyltoluene	100	U	2500	2780	111	2500	2800	112	1	79-130/16
74-83-9	Methyl Bromide	200	U	2500	2570	103	2500	2490	100	3	59-143/19
74-87-3	Methyl Chloride	200	U	2500	2580	103	2500	2690	108	4	50-159/19
74-95-3	Methylene Bromide	200	U	2500	2560	102	2500	2730	109	6	78-119/14
75-09-2	Methylene Chloride	500	U	2500	2800	112	2500	2840	114	1	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	500	U	12500	12700	102	12500	13100	105	3	66-122/16
91-20-3	Naphthalene	500	U	2500	2460	98	2500	2540	102	3	63-132/25
103-65-1	n-Propylbenzene	100	U	2500	2680	107	2500	2710	108	1	82-133/15
100-42-5	Styrene	100	U	2500	2730	109	2500	2780	111	2	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	100	U	2500	2670	107	2500	2770	111	4	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	100	U	2500	2580	103	2500	2650	106	3	72-120/14
127-18-4	Tetrachloroethylene	100	U	2500	2710	108	2500	2760	110	2	76-135/16
108-88-3	Toluene	100	U	2500	2670	107	2500	2680	107	0	80-120/14
87-61-6	1,2,3-Trichlorobenzene	200	U	2500	2630	105	2500	2630	105	0	68-131/25
120-82-1	1,2,4-Trichlorobenzene	200	U	2500	2560	102	2500	2620	105	2	73-129/20
71-55-6	1,1,1-Trichloroethane	100	U	2500	2650	106	2500	2630	105	1	75-130/16
79-00-5	1,1,2-Trichloroethane	100	U	2500	2650	106	2500	2640	106	0	76-119/14
79-01-6	Trichloroethylene	100	U	2500	2640	106	2500	2760	110	4	81-126/15
75-69-4	Trichlorofluoromethane	200	U	2500	3030	121	2500	3060	122	1	71-156/21
96-18-4	1,2,3-Trichloropropane	200	U	2500	2510	100	2500	2430	97	3	77-120/16
95-63-6	1,2,4-Trimethylbenzene	100	U	2500	2590	104	2500	2630	105	2	79-120/18
108-67-8	1,3,5-Trimethylbenzene	100	U	2500	2710	108	2500	2730	109	1	79-120/19
75-01-4	Vinyl Chloride	6920		2500	8650	69	2500	9050	85	5	69-159/18
	m,p-Xylene	200	U	5000	5390	108	5000	5440	109	1	79-126/15
95-47-6	o-Xylene	100	U	2500	2580	103	2500	2630	105	2	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50455-6	Limits
1868-53-7	Dibromofluoromethane	100%	102%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	110%	79-125%
2037-26-5	Toluene-D8	99%	98%	98%	85-112%
460-00-4	4-Bromofluorobenzene	96%	94%	96%	83-118%

\* = Outside of Control Limits.

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## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50455-6MS	J0988406.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6MSD	J0988407.D	100	12/22/17	WV	n/a	n/a	VJ5783
FA50455-6 <sup>a</sup>	J0988397.D	100	12/22/17	WV	n/a	n/a	VJ5783

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14, FA50344-15

(a) Sample was not preserved to a pH < 2.

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\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50344-10MS	I52320.D	25	12/22/17	TD	n/a	n/a	VI1526
FA50344-10MSD	I52321.D	25	12/22/17	TD	n/a	n/a	VI1526
FA50344-10	I52316.D	25	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	FA50344-10		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	ND		3130	3500	112	3130	3450	110	1	50-147/21
71-43-2	Benzene	ND		625	661	106	625	682	109	3	81-122/14
108-86-1	Bromobenzene	ND		625	615	98	625	631	101	3	80-121/14
74-97-5	Bromochloromethane	ND		625	638	102	625	668	107	5	76-123/14
75-27-4	Bromodichloromethane	ND		625	598	96	625	627	100	5	79-123/19
75-25-2	Bromoform	ND		625	410	66	625	445	71	8	66-123/21
78-93-3	2-Butanone (MEK)	ND		3130	3660	117	3130	3580	115	2	56-143/18
104-51-8	n-Butylbenzene	ND		625	590	94	625	605	97	3	79-126/16
135-98-8	sec-Butylbenzene	ND		625	645	103	625	658	105	2	83-133/16
98-06-6	tert-Butylbenzene	ND		625	614	98	625	632	101	3	80-133/16
75-15-0	Carbon Disulfide	ND		625	541	87	625	579	93	7	66-148/23
56-23-5	Carbon Tetrachloride	ND		625	625	100	625	652	104	4	76-136/23
108-90-7	Chlorobenzene	ND		625	618	99	625	641	103	4	82-124/14
75-00-3	Chloroethane	ND		625	1030	165*	625	901	144	13	62-144/20
67-66-3	Chloroform	ND		625	636	102	625	661	106	4	80-124/15
95-49-8	o-Chlorotoluene	ND		625	632	101	625	651	104	3	81-127/15
106-43-4	p-Chlorotoluene	ND		625	621	99	625	644	103	4	83-130/15
124-48-1	Dibromochloromethane	ND		625	493	79	625	527	84	7	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		625	627	100	625	653	104	4	64-123/18
106-93-4	1,2-Dibromoethane	ND		625	660	106	625	686	110	4	75-120/13
75-71-8	Dichlorodifluoromethane	ND		625	622	100	625	605	97	3	42-167/19
95-50-1	1,2-Dichlorobenzene	8.7		625	610	98	625	631	101	3	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		625	615	98	625	633	101	3	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		625	598	96	625	613	98	2	78-120/15
75-34-3	1,1-Dichloroethane	129		625	834	133*	625	866	138*	4	81-122/15
107-06-2	1,2-Dichloroethane	ND		625	647	104	625	674	108	4	75-125/14
75-35-4	1,1-Dichloroethylene	199		625	924	147*	625	955	152*	3	78-137/18
156-59-2	cis-1,2-Dichloroethylene	1310		625	2080	324*	625	2130	332*	2	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		625	689	110	625	734	117	6	76-127/17
78-87-5	1,2-Dichloropropane	ND		625	641	103	625	670	107	4	76-124/14
142-28-9	1,3-Dichloropropane	ND		625	627	100	625	642	103	2	80-118/13
594-20-7	2,2-Dichloropropane	ND		625	610	98	625	633	101	4	74-139/17
563-58-6	1,1-Dichloropropene	ND		625	649	104	625	679	109	5	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		625	519	83	625	550	88	6	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		625	587	94	625	614	98	4	80-120/22
100-41-4	Ethylbenzene	ND		625	632	101	625	653	104	3	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50344-10MS	I52320.D	25	12/22/17	TD	n/a	n/a	VI1526
FA50344-10MSD	I52321.D	25	12/22/17	TD	n/a	n/a	VI1526
FA50344-10	I52316.D	25	12/22/17	TD	n/a	n/a	VI1526

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-6, FA50344-7, FA50344-8, FA50344-9, FA50344-10, FA50344-11, FA50344-12

CAS No.	Compound	FA50344-10		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	ND	625	565	90	625	594	95	5	75-142/19	
591-78-6	2-Hexanone	ND	3130	3700	118	3130	3570	114	4	61-129/18	
98-82-8	Isopropylbenzene	ND	625	656	105	625	679	109	3	83-132/15	
99-87-6	p-Isopropyltoluene	ND	625	637	102	625	653	104	2	79-130/16	
74-83-9	Methyl Bromide	ND	625	748	120	625	721	115	4	59-143/19	
74-87-3	Methyl Chloride	ND	625	525	84	625	511	82	3	50-159/19	
74-95-3	Methylene Bromide	ND	625	676	108	625	700	112	3	78-119/14	
75-09-2	Methylene Chloride	ND	625	669	107	625	694	111	4	69-135/16	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	3130	3550	114	3130	3460	111	3	66-122/16	
91-20-3	Naphthalene	ND	625	643	103	625	666	107	4	63-132/25	
103-65-1	n-Propylbenzene	ND	625	641	103	625	657	105	2	82-133/15	
100-42-5	Styrene	ND	625	604	97	625	622	100	3	78-119/23	
630-20-6	1,1,1,2-Tetrachloroethane	ND	625	642	103	625	672	108	5	77-122/19	
79-34-5	1,1,2,2-Tetrachloroethane	ND	625	717	115	625	737	118	3	72-120/14	
127-18-4	Tetrachloroethylene	8.8	625	633	101	625	655	105	3	76-135/16	
108-88-3	Toluene	ND	625	628	100	625	645	103	3	80-120/14	
87-61-6	1,2,3-Trichlorobenzene	ND	625	580	93	625	606	97	4	68-131/25	
120-82-1	1,2,4-Trichlorobenzene	ND	625	574	92	625	589	94	3	73-129/20	
71-55-6	1,1,1-Trichloroethane	ND	625	634	101	625	658	105	4	75-130/16	
79-00-5	1,1,2-Trichloroethane	ND	625	685	110	625	696	111	2	76-119/14	
79-01-6	Trichloroethylene	106	625	780	124	625	803	128*	3	81-126/15	
75-69-4	Trichlorofluoromethane	ND	625	753	120	625	729	117	3	71-156/21	
96-18-4	1,2,3-Trichloropropane	ND	625	684	109	625	698	112	2	77-120/16	
95-63-6	1,2,4-Trimethylbenzene	ND	625	611	98	625	629	101	3	79-120/18	
108-67-8	1,3,5-Trimethylbenzene	ND	625	649	104	625	664	106	2	79-120/19	
75-01-4	Vinyl Chloride	854	625	1520	238*	625	1530	239*	1	69-159/18	
	m,p-Xylene	ND	1250	1270	102	1250	1320	106	4	79-126/15	
95-47-6	o-Xylene	ND	625	607	97	625	631	101	4	80-127/14	

CAS No.	Surrogate Recoveries	MS	MSD	FA50344-10 Limits
1868-53-7	Dibromofluoromethane	100%	101%	99% 83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	108%	107% 79-125%
2037-26-5	Toluene-D8	99%	99%	99% 85-112%
460-00-4	4-Bromofluorobenzene	97%	96%	97% 83-118%

\* = Outside of Control Limits.

6.3.4

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50492-1MS	J0988466.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1MSD	J0988467.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1 <sup>a</sup>	J0988446.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	FA50492-1		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	25	U	125	124	99	125	125	100	1	50-147/21
71-43-2	Benzene	1.0	U	25	25.6	102	25	25.9	104	1	81-122/14
108-86-1	Bromobenzene	1.0	U	25	24.9	100	25	26.1	104	5	80-121/14
74-97-5	Bromochloromethane	1.0	U	25	25.3	101	25	26.5	106	5	76-123/14
75-27-4	Bromodichloromethane	1.0	U	25	24.2	97	25	24.8	99	2	79-123/19
75-25-2	Bromoform	1.0	U	25	16.2	65*	25	15.4	62*	5	66-123/21
78-93-3	2-Butanone (MEK)	5.0	U	125	129	103	125	128	102	1	56-143/18
104-51-8	n-Butylbenzene	1.0	U	25	25.5	102	25	26.2	105	3	79-126/16
135-98-8	sec-Butylbenzene	1.0	U	25	25.9	104	25	27.0	108	4	83-133/16
98-06-6	tert-Butylbenzene	1.0	U	25	25.6	102	25	26.2	105	2	80-133/16
75-15-0	Carbon Disulfide	2.0	U	25	24.0	96	25	25.1	100	4	66-148/23
56-23-5	Carbon Tetrachloride	1.0	U	25	23.9	96	25	26.0	104	8	76-136/23
108-90-7	Chlorobenzene	1.0	U	25	24.7	99	25	25.7	103	4	82-124/14
75-00-3	Chloroethane	2.0	U	25	29.3	117	25	29.5	118	1	62-144/20
67-66-3	Chloroform	1.0	U	25	25.6	102	25	26.0	104	2	80-124/15
95-49-8	o-Chlorotoluene	1.0	U	25	25.2	101	25	25.9	104	3	81-127/15
106-43-4	p-Chlorotoluene	1.0	U	25	25.3	101	25	26.2	105	3	83-130/15
124-48-1	Dibromochloromethane	1.0	U	25	20.1	80	25	20.5	82	2	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U	25	21.5	86	25	20.7	83	4	64-123/18
106-93-4	1,2-Dibromoethane	2.0	U	25	24.4	98	25	25.4	102	4	75-120/13
75-71-8	Dichlorodifluoromethane	2.0	U	25	26.5	106	25	27.5	110	4	42-167/19
95-50-1	1,2-Dichlorobenzene	1.0	U	25	24.1	96	25	25.3	101	5	82-124/14
541-73-1	1,3-Dichlorobenzene	1.0	U	25	24.5	98	25	25.8	103	5	84-125/14
106-46-7	1,4-Dichlorobenzene	1.0	U	25	24.3	97	25	25.3	101	4	78-120/15
75-34-3	1,1-Dichloroethane	1.0	U	25	27.3	109	25	27.5	110	1	81-122/15
107-06-2	1,2-Dichloroethane	1.0	U	25	25.3	101	25	25.9	104	2	75-125/14
75-35-4	1,1-Dichloroethylene	1.0	U	25	25.9	104	25	26.7	107	3	78-137/18
156-59-2	cis-1,2-Dichloroethylene	1.0	U	25	24.5	98	25	25.7	103	5	78-120/15
156-60-5	trans-1,2-Dichloroethylene	0.33	J	25	27.3	108	25	27.3	108	0	76-127/17
78-87-5	1,2-Dichloropropane	1.0	U	25	25.0	100	25	26.1	104	4	76-124/14
142-28-9	1,3-Dichloropropane	1.0	U	25	23.4	94	25	23.9	96	2	80-118/13
594-20-7	2,2-Dichloropropane	1.0	U	25	24.7	99	25	24.9	100	1	74-139/17
563-58-6	1,1-Dichloropropene	1.0	U	25	25.1	100	25	26.0	104	4	79-131/16
10061-01-5	cis-1,3-Dichloropropene	1.0	U	25	17.9	72*	25	17.9	72*	0	75-118/23
10061-02-6	trans-1,3-Dichloropropene	1.0	U	25	17.1	68*	25	15.6	62*	9	80-120/22
100-41-4	Ethylbenzene	1.0	U	25	24.5	98	25	25.7	103	5	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50492-1MS	J0988466.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1MSD	J0988467.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1 <sup>a</sup>	J0988446.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

CAS No.	Compound	FA50492-1		Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q								
87-68-3	Hexachlorobutadiene	2.0	U	25	25.1	100	25	26.1	104	4	75-142/19
591-78-6	2-Hexanone	10	U	125	125	100	125	127	102	2	61-129/18
98-82-8	Isopropylbenzene	1.0	U	25	26.7	107	25	27.8	111	4	83-132/15
99-87-6	p-Isopropyltoluene	1.0	U	25	26.2	105	25	27.6	110	5	79-130/16
74-83-9	Methyl Bromide	2.0	U	25	22.8	91	25	23.6	94	3	59-143/19
74-87-3	Methyl Chloride	2.0	U	25	28.7	115	25	28.1	112	2	50-159/19
74-95-3	Methylene Bromide	2.0	U	25	25.3	101	25	26.6	106	5	78-119/14
75-09-2	Methylene Chloride	5.0	U	25	26.9	108	25	27.0	108	0	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	5.0	U	125	127	102	125	129	103	2	66-122/16
91-20-3	Naphthalene	5.0	U	25	23.5	94	25	24.8	99	5	63-132/25
103-65-1	n-Propylbenzene	1.0	U	25	25.6	102	25	26.4	106	3	82-133/15
100-42-5	Styrene	1.0	U	25	24.9	100	25	26.4	106	6	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	1.0	U	25	26.0	104	25	26.3	105	1	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	1.0	U	25	24.0	96	25	25.7	103	7	72-120/14
127-18-4	Tetrachloroethylene	1.0	U	25	25.0	100	25	26.1	104	4	76-135/16
108-88-3	Toluene	1.0	U	25	25.0	100	25	26.3	105	5	80-120/14
87-61-6	1,2,3-Trichlorobenzene	2.0	U	25	24.6	98	25	25.9	104	5	68-131/25
120-82-1	1,2,4-Trichlorobenzene	2.0	U	25	23.9	96	25	25.8	103	8	73-129/20
71-55-6	1,1,1-Trichloroethane	1.0	U	25	24.6	98	25	25.9	104	5	75-130/16
79-00-5	1,1,2-Trichloroethane	1.0	U	25	24.9	100	25	25.3	101	2	76-119/14
79-01-6	Trichloroethylene	1.0	U	25	26.7	107	25	27.4	110	3	81-126/15
75-69-4	Trichlorofluoromethane	2.0	U	25	31.1	124	25	30.0	120	4	71-156/21
96-18-4	1,2,3-Trichloropropane	2.0	U	25	23.7	95	25	24.6	98	4	77-120/16
95-63-6	1,2,4-Trimethylbenzene	1.0	U	25	25.0	100	25	25.9	104	4	79-120/18
108-67-8	1,3,5-Trimethylbenzene	1.0	U	25	25.5	102	25	26.9	108	5	79-120/19
75-01-4	Vinyl Chloride	0.86	J	25	27.4	106	25	27.2	105	1	69-159/18
	m,p-Xylene	2.0	U	50	51.3	103	50	52.2	104	2	79-126/15
95-47-6	o-Xylene	1.0	U	25	24.5	98	25	25.5	102	4	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50492-1	Limits
1868-53-7	Dibromofluoromethane	99%	102%	103%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	104%	105%	79-125%
2037-26-5	Toluene-D8	97%	99%	98%	85-112%
460-00-4	4-Bromofluorobenzene	94%	97%	96%	83-118%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50492-1MS	J0988466.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1MSD	J0988467.D	1	12/26/17	MM	n/a	n/a	VJ5785
FA50492-1 <sup>a</sup>	J0988446.D	1	12/26/17	MM	n/a	n/a	VJ5785

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-16, FA50344-17, FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22, FA50344-23, FA50344-24, FA50344-25, FA50344-26

(a) Sample was not preserved to a pH < 2.

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\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-3MS	M0100560.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3MSD	M0100561.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3 <sup>a</sup>	M0100548.D	20	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	FA50381-3		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	2660		2500	4980	93	2500	5200	102	4	50-147/21
71-43-2	Benzene	20 U		500	516	103	500	465	93	10	81-122/14
108-86-1	Bromobenzene	20 U		500	495	99	500	433	87	13	80-121/14
74-97-5	Bromochloromethane	20 U		500	536	107	500	483	97	10	76-123/14
75-27-4	Bromodichloromethane	20 U		500	522	104	500	466	93	11	79-123/19
75-25-2	Bromoform	20 U		500	467	93	500	412	82	13	66-123/21
78-93-3	2-Butanone (MEK)	8430		2500	11400	119	2500	11400	119	0	56-143/18
104-51-8	n-Butylbenzene	20 U		500	499	100	500	435	87	14	79-126/16
135-98-8	sec-Butylbenzene	20 U		500	517	103	500	460	92	12	83-133/16
98-06-6	tert-Butylbenzene	20 U		500	472	94	500	416	83	13	80-133/16
75-15-0	Carbon Disulfide	40 U		500	499	100	500	467	93	7	66-148/23
56-23-5	Carbon Tetrachloride	20 U		500	515	103	500	465	93	10	76-136/23
108-90-7	Chlorobenzene	20 U		500	477	95	500	434	87	9	82-124/14
75-00-3	Chloroethane	40 U		500	769	154*	500	717	143	7	62-144/20
67-66-3	Chloroform	20 U		500	492	98	500	442	88	11	80-124/15
95-49-8	o-Chlorotoluene	20 U		500	481	96	500	428	86	12	81-127/15
106-43-4	p-Chlorotoluene	20 U		500	496	99	500	438	88	12	83-130/15
124-48-1	Dibromochloromethane	20 U		500	500	100	500	455	91	9	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	100 U		500	494	99	500	417	83	17	64-123/18
106-93-4	1,2-Dibromoethane	40 U		500	514	103	500	465	93	10	75-120/13
75-71-8	Dichlorodifluoromethane	40 U		500	649	130	500	605	121	7	42-167/19
95-50-1	1,2-Dichlorobenzene	20 U		500	499	100	500	437	87	13	82-124/14
541-73-1	1,3-Dichlorobenzene	20 U		500	510	102	500	444	89	14	84-125/14
106-46-7	1,4-Dichlorobenzene	20 U		500	502	100	500	429	86	16*	78-120/15
75-34-3	1,1-Dichloroethane	20 U		500	515	103	500	477	95	8	81-122/15
107-06-2	1,2-Dichloroethane	20 U		500	474	95	500	437	87	8	75-125/14
75-35-4	1,1-Dichloroethylene	20 U		500	493	99	500	459	92	7	78-137/18
156-59-2	cis-1,2-Dichloroethylene	8.4 J		500	542	107	500	498	98	8	78-120/15
156-60-5	trans-1,2-Dichloroethylene	20 U		500	511	102	500	470	94	8	76-127/17
78-87-5	1,2-Dichloropropane	20 U		500	496	99	500	463	93	7	76-124/14
142-28-9	1,3-Dichloropropane	20 U		500	450	90	500	395	79*	13	80-118/13
594-20-7	2,2-Dichloropropane	20 U		500	433	87	500	398	80	8	74-139/17
563-58-6	1,1-Dichloropropene	20 U		500	489	98	500	453	91	8	79-131/16
10061-01-5	cis-1,3-Dichloropropene	20 U		500	470	94	500	428	86	9	75-118/23
10061-02-6	trans-1,3-Dichloropropene	20 U		500	457	91	500	399	80	14	80-120/22
100-41-4	Ethylbenzene	20 U		500	479	96	500	438	88	9	81-121/14

\* = Outside of Control Limits.

6.3.6  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-3MS	M0100560.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3MSD	M0100561.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3 <sup>a</sup>	M0100548.D	20	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-13, FA50344-14

CAS No.	Compound	FA50381-3		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	40	U	500	485	97	500	422	84	14	75-142/19
591-78-6	2-Hexanone	42.0	J	2500	2780	110	2500	2730	108	2	61-129/18
98-82-8	Isopropylbenzene	20	U	500	512	102	500	468	94	9	83-132/15
99-87-6	p-Isopropyltoluene	20	U	500	522	104	500	449	90	15	79-130/16
74-83-9	Methyl Bromide	40	U	500	707	141	500	697	139	1	59-143/19
74-87-3	Methyl Chloride	40	U	500	564	113	500	562	112	0	50-159/19
74-95-3	Methylene Bromide	40	U	500	541	108	500	470	94	14	78-119/14
75-09-2	Methylene Chloride	100	U	500	512	102	500	477	95	7	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	100	U	2500	2850	114	2500	2750	110	4	66-122/16
91-20-3	Naphthalene	100	U	500	560	112	500	466	93	18	63-132/25
103-65-1	n-Propylbenzene	20	U	500	480	96	500	427	85	12	82-133/15
100-42-5	Styrene	20	U	500	489	98	500	437	87	11	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	20	U	500	491	98	500	459	92	7	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	20	U	500	511	102	500	448	90	13	72-120/14
108-88-3	Toluene	20	U	500	499	100	500	446	89	11	80-120/14
87-61-6	1,2,3-Trichlorobenzene	40	U	500	498	100	500	434	87	14	68-131/25
120-82-1	1,2,4-Trichlorobenzene	40	U	500	489	98	500	427	85	14	73-129/20
71-55-6	1,1,1-Trichloroethane	20	U	500	472	94	500	441	88	7	75-130/16
79-00-5	1,1,2-Trichloroethane	20	U	500	487	97	500	423	85	14	76-119/14
79-01-6	Trichloroethylene	20	U	500	542	108	500	496	99	9	81-126/15
75-69-4	Trichlorofluoromethane	40	U	500	674	135	500	651	130	3	71-156/21
96-18-4	1,2,3-Trichloropropane	40	U	500	503	101	500	423	85	17*	77-120/16
95-63-6	1,2,4-Trimethylbenzene	20	U	500	491	98	500	442	88	11	79-120/18
108-67-8	1,3,5-Trimethylbenzene	20	U	500	503	101	500	446	89	12	79-120/19
75-01-4	Vinyl Chloride	143		500	688	109	500	722	116	5	69-159/18
	m,p-Xylene	40	U	1000	936	94	1000	852	85	9	79-126/15
95-47-6	o-Xylene	20	U	500	471	94	500	424	85	11	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50381-3	Limits
1868-53-7	Dibromofluoromethane	101%	104%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	93%	94%	95%	79-125%
2037-26-5	Toluene-D8	94%	94%	98%	85-112%
460-00-4	4-Bromofluorobenzene	101%	100%	103%	83-118%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50381-3MS	M0100560.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3MSD	M0100561.D	20	12/26/17	WV	n/a	n/a	VM4322
FA50381-3 <sup>a</sup>	M0100548.D	20	12/26/17	WV	n/a	n/a	VM4322

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-13, FA50344-14

(a) Sample was not preserved to a pH < 2. Confirmation run.

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\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50344-19MS	I52413.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19MSD	I52414.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19	I52394.D	50	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	FA50344-19		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	793		6250	6270	88	6250	6180	86	1	50-147/21
71-43-2	Benzene	70.3		1250	1260	95	1250	1220	92	3	81-122/14
108-86-1	Bromobenzene	ND		1250	1190	95	1250	1150	92	3	80-121/14
74-97-5	Bromochloromethane	ND		1250	1180	94	1250	1140	91	3	76-123/14
75-27-4	Bromodichloromethane	ND		1250	1210	97	1250	1170	94	3	79-123/19
75-25-2	Bromoform	ND		1250	884	71	1250	874	70	1	66-123/21
78-93-3	2-Butanone (MEK)	ND		6250	6060	97	6250	5990	96	1	56-143/18
104-51-8	n-Butylbenzene	ND		1250	1080	86	1250	1020	82	6	79-126/16
135-98-8	sec-Butylbenzene	ND		1250	1270	102	1250	1220	98	4	83-133/16
98-06-6	tert-Butylbenzene	ND		1250	1220	98	1250	1170	94	4	80-133/16
75-15-0	Carbon Disulfide	ND		1250	1160	93	1250	1120	90	4	66-148/23
56-23-5	Carbon Tetrachloride	ND		1250	1040	83	1250	1010	81	3	76-136/23
108-90-7	Chlorobenzene	ND		1250	1190	95	1250	1160	93	3	82-124/14
75-00-3	Chloroethane	ND		1250	1330	106	1250	1170	94	13	62-144/20
67-66-3	Chloroform	21.3		1250	1220	96	1250	1180	93	3	80-124/15
95-49-8	o-Chlorotoluene	ND		1250	1240	99	1250	1180	94	5	81-127/15
106-43-4	p-Chlorotoluene	ND		1250	1200	96	1250	1160	93	3	83-130/15
124-48-1	Dibromochloromethane	ND		1250	992	79	1250	978	78	1	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		1250	1040	83	1250	1020	82	2	64-123/18
106-93-4	1,2-Dibromoethane	ND		1250	1190	95	1250	1170	94	2	75-120/13
75-71-8	Dichlorodifluoromethane	ND		1250	1260	101	1250	1260	101	0	42-167/19
95-50-1	1,2-Dichlorobenzene	63.3		1250	1230	93	1250	1190	90	3	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		1250	1210	97	1250	1160	93	4	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		1250	1160	93	1250	1120	90	4	78-120/15
75-34-3	1,1-Dichloroethane	1290		1250	2320	82	1250	2220	74*	4	81-122/15
107-06-2	1,2-Dichloroethane	ND		1250	1180	94	1250	1160	93	2	75-125/14
75-35-4	1,1-Dichloroethylene	752		1250	1790	83	1250	1740	79	3	78-137/18
156-59-2	cis-1,2-Dichloroethylene	6290	E	1250	6300	1* a	1250	6050	-19* a	4	78-120/15
156-60-5	trans-1,2-Dichloroethylene	39.2		1250	1300	101	1250	1250	97	4	76-127/17
78-87-5	1,2-Dichloropropane	ND		1250	1200	96	1250	1150	92	4	76-124/14
142-28-9	1,3-Dichloropropane	ND		1250	1130	90	1250	1100	88	3	80-118/13
594-20-7	2,2-Dichloropropane	ND		1250	1010	81	1250	983	79	3	74-139/17
563-58-6	1,1-Dichloropropene	ND		1250	1210	97	1250	1170	94	3	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		1250	943	75	1250	921	74*	2	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		1250	1030	82	1250	1020	82	1	80-120/22
100-41-4	Ethylbenzene	779		1250	1810	82	1250	1750	78*	3	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

Job Number: FA50344

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50344-19MS	I52413.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19MSD	I52414.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19	I52394.D	50	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

CAS No.	Compound	FA50344-19		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	ND		1250	1200	96	1250	1170	94	3	75-142/19
591-78-6	2-Hexanone	ND		6250	6210	99	6250	6110	98	2	61-129/18
98-82-8	Isopropylbenzene	18.0		1250	1340	106	1250	1290	102	4	83-132/15
99-87-6	p-Isopropyltoluene	35.0		1250	1160	90	1250	1110	86	4	79-130/16
74-83-9	Methyl Bromide	ND		1250	1300	104	1250	1230	98	6	59-143/19
74-87-3	Methyl Chloride	ND		1250	1340	107	1250	1310	105	2	50-159/19
74-95-3	Methylene Bromide	ND		1250	1220	98	1250	1170	94	4	78-119/14
75-09-2	Methylene Chloride	413		1250	1510	88	1250	1460	84	3	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	348		6250	6830	104	6250	6740	102	1	66-122/16
91-20-3	Naphthalene	ND		1250	1140	91	1250	1110	89	3	63-132/25
103-65-1	n-Propylbenzene	35.9		1250	1250	97	1250	1200	93	4	82-133/15
100-42-5	Styrene	81.8		1250	1070	79	1250	1040	77*	3	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	ND		1250	1270	102	1250	1230	98	3	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	ND		1250	1220	98	1250	1180	94	3	72-120/14
127-18-4	Tetrachloroethylene	2580		1250	3090	41* a	1250	2940	29* a	5	76-135/16
108-88-3	Toluene	4390		1250	4590	16* a	1250	4430	3* a	4	80-120/14
87-61-6	1,2,3-Trichlorobenzene	ND		1250	1180	94	1250	1150	92	3	68-131/25
120-82-1	1,2,4-Trichlorobenzene	ND		1250	1190	95	1250	1160	93	3	73-129/20
79-00-5	1,1,2-Trichloroethane	ND		1250	1210	97	1250	1180	94	3	76-119/14
79-01-6	Trichloroethylene	4060		1250	4300	19* a	1250	4100	3* a	5	81-126/15
75-69-4	Trichlorofluoromethane	ND		1250	1470	118	1250	1440	115	2	71-156/21
96-18-4	1,2,3-Trichloropropane	ND		1250	1180	94	1250	1130	90	4	77-120/16
95-63-6	1,2,4-Trimethylbenzene	244		1250	1310	85	1250	1250	80	5	79-120/18
108-67-8	1,3,5-Trimethylbenzene	99.9		1250	1360	101	1250	1300	96	5	79-120/19
75-01-4	Vinyl Chloride	1990		1250	2560	46*	1250	2500	41*	2	69-159/18
	m,p-Xylene	1470		1250	3630	86	1250	3510	82	3	79-126/15
95-47-6	o-Xylene	560		1250	1670	89	1250	1630	86	2	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50344-19 Limits
1868-53-7	Dibromofluoromethane	102%	101%	99% 83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	101% 79-125%
2037-26-5	Toluene-D8	99%	100%	99% 85-112%
460-00-4	4-Bromofluorobenzene	99%	99%	100% 83-118%

\* = Outside of Control Limits.

6.3.7  
6

## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50344-19MS	I52413.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19MSD	I52414.D	50	12/27/17	MM	n/a	n/a	VI1530
FA50344-19	I52394.D	50	12/27/17	MM	n/a	n/a	VI1530

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-18, FA50344-19, FA50344-20, FA50344-21, FA50344-22

(a) Outside control limits due to high level in sample relative to spike amount.

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\* = Outside of Control Limits.

6.3.7  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

Job Number: FA50344

Account: UNIVAR Univar

Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50305-2MS	J0988522.D	10	12/28/17	SP	n/a	n/a	VJ5787
FA50305-2MSD	J0988523.D	10	12/28/17	SP	n/a	n/a	VJ5787
FA50305-2	J0988512.D	10	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	FA50305-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	ND		1250	1260	101	1250	1290	103	2	50-147/21
71-43-2	Benzene	ND		250	270	108	250	268	107	1	81-122/14
108-86-1	Bromobenzene	ND		250	267	107	250	271	108	1	80-121/14
74-97-5	Bromochloromethane	ND		250	264	106	250	278	111	5	76-123/14
75-27-4	Bromodichloromethane	ND		250	254	102	250	251	100	1	79-123/19
75-25-2	Bromoform	ND		250	179	72	250	177	71	1	66-123/21
78-93-3	2-Butanone (MEK)	ND		1250	1270	102	1250	1270	102	0	56-143/18
104-51-8	n-Butylbenzene	ND		250	269	108	250	272	109	1	79-126/16
135-98-8	sec-Butylbenzene	ND		250	274	110	250	278	111	1	83-133/16
98-06-6	tert-Butylbenzene	ND		250	264	106	250	268	107	2	80-133/16
75-15-0	Carbon Disulfide	ND		250	216	86	250	224	90	4	66-148/23
56-23-5	Carbon Tetrachloride	ND		250	259	104	250	257	103	1	76-136/23
108-90-7	Chlorobenzene	ND		250	264	106	250	266	106	1	82-124/14
75-00-3	Chloroethane	ND		250	282	113	250	272	109	4	62-144/20
67-66-3	Chloroform	ND		250	263	105	250	265	106	1	80-124/15
95-49-8	o-Chlorotoluene	ND		250	266	106	250	268	107	1	81-127/15
106-43-4	p-Chlorotoluene	ND		250	263	105	250	269	108	2	83-130/15
124-48-1	Dibromochloromethane	ND		250	214	86	250	212	85	1	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		250	217	87	250	222	89	2	64-123/18
106-93-4	1,2-Dibromoethane	ND		250	270	108	250	265	106	2	75-120/13
75-71-8	Dichlorodifluoromethane	ND		250	273	109	250	283	113	4	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		250	262	105	250	264	106	1	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		250	268	107	250	273	109	2	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		250	255	102	250	260	104	2	78-120/15
75-34-3	1,1-Dichloroethane	178		250	437	104	250	439	104	0	81-122/15
107-06-2	1,2-Dichloroethane	ND		250	259	104	250	263	105	2	75-125/14
75-35-4	1,1-Dichloroethylene	3.5	J	250	281	111	250	287	113	2	78-137/18
156-59-2	cis-1,2-Dichloroethylene	9.2	J	250	278	108	250	278	108	0	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		250	281	112	250	282	113	0	76-127/17
78-87-5	1,2-Dichloropropane	ND		250	261	104	250	269	108	3	76-124/14
142-28-9	1,3-Dichloropropane	ND		250	245	98	250	249	100	2	80-118/13
594-20-7	2,2-Dichloropropane	ND		250	236	94	250	235	94	0	74-139/17
563-58-6	1,1-Dichloropropene	ND		250	270	108	250	268	107	1	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		250	228	91	250	224	90	2	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		250	222	89	250	225	90	1	80-120/22
100-41-4	Ethylbenzene	ND		250	259	104	250	262	105	1	81-121/14

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50305-2MS	J0988522.D	10	12/28/17	SP	n/a	n/a	VJ5787
FA50305-2MSD	J0988523.D	10	12/28/17	SP	n/a	n/a	VJ5787
FA50305-2	J0988512.D	10	12/28/17	SP	n/a	n/a	VJ5787

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-27, FA50344-28, FA50344-29, FA50344-30, FA50344-31

CAS No.	Compound	FA50305-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	ND		250	273	109	250	274	110	0	75-142/19
591-78-6	2-Hexanone	ND		1250	1200	96	1250	1240	99	3	61-129/18
98-82-8	Isopropylbenzene	ND		250	282	113	250	290	116	3	83-132/15
99-87-6	p-Isopropyltoluene	ND		250	281	112	250	282	113	0	79-130/16
74-83-9	Methyl Bromide	ND		250	234	94	250	220	88	6	59-143/19
74-87-3	Methyl Chloride	ND		250	279	112	250	275	110	1	50-159/19
74-95-3	Methylene Bromide	ND		250	278	111	250	276	110	1	78-119/14
75-09-2	Methylene Chloride	ND		250	279	112	250	286	114	2	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		1250	1250	100	1250	1250	100	0	66-122/16
91-20-3	Naphthalene	ND		250	251	100	250	260	104	4	63-132/25
103-65-1	n-Propylbenzene	ND		250	268	107	250	271	108	1	82-133/15
100-42-5	Styrene	ND		250	271	108	250	282	113	4	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	ND		250	273	109	250	278	111	2	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	ND		250	256	102	250	264	106	3	72-120/14
127-18-4	Tetrachloroethylene	ND		250	265	106	250	264	106	0	76-135/16
108-88-3	Toluene	ND		250	265	106	250	269	108	1	80-120/14
87-61-6	1,2,3-Trichlorobenzene	ND		250	257	103	250	272	109	6	68-131/25
120-82-1	1,2,4-Trichlorobenzene	ND		250	260	104	250	264	106	2	73-129/20
71-55-6	1,1,1-Trichloroethane	ND		250	266	106	250	269	108	1	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		250	261	104	250	263	105	1	76-119/14
79-01-6	Trichloroethylene	3.7	J	250	283	112	250	286	113	1	81-126/15
75-69-4	Trichlorofluoromethane	ND		250	298	119	250	291	116	2	71-156/21
96-18-4	1,2,3-Trichloropropane	ND		250	234	94	250	255	102	9	77-120/16
95-63-6	1,2,4-Trimethylbenzene	ND		250	261	104	250	263	105	1	79-120/18
108-67-8	1,3,5-Trimethylbenzene	ND		250	276	110	250	278	111	1	79-120/19
75-01-4	Vinyl Chloride	ND		250	260	104	250	267	107	3	69-159/18
	m,p-Xylene	ND		500	536	107	500	535	107	0	79-126/15
95-47-6	o-Xylene	ND		250	261	104	250	267	107	2	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50305-2	Limits
1868-53-7	Dibromofluoromethane	102%	102%	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	101%	108%	79-125%
2037-26-5	Toluene-D8	98%	99%	97%	85-112%
460-00-4	4-Bromofluorobenzene	95%	96%	96%	83-118%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50382-3MS	J0988555.D	5	12/29/17	MM	n/a	n/a	VJ5789
FA50382-3MSD	J0988556.D	5	12/29/17	MM	n/a	n/a	VJ5789
FA50382-3	J0988537.D	1	12/29/17	MM	n/a	n/a	VJ5789

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-19

CAS No.	Compound	FA50382-3		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
71-55-6	1,1,1-Trichloroethane	1.0	U	125	134	107	125	132	106	2	75-130/16
CAS No.	Surrogate Recoveries	MS	MSD	FA50382-3		Limits					
1868-53-7	Dibromofluoromethane	102%	101%	100%	83-118%						
17060-07-0	1,2-Dichloroethane-D4	108%	105%	103%	79-125%						
2037-26-5	Toluene-D8	95%	97%	97%	85-112%						
460-00-4	4-Bromofluorobenzene	94%	97%	93%	83-118%						

\* = Outside of Control Limits.

6.3.9  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50426-7MS	P54771.D	10	12/30/17	TD	n/a	n/a	VP2077
FA50426-7MSD	P54772.D	10	12/30/17	TD	n/a	n/a	VP2077
FA50426-7	P54751.D	50	12/29/17	TD	n/a	n/a	VP2077

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-30, FA50344-31

CAS No.	Compound	FA50426-7		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
156-59-2	cis-1,2-Dichloroethylene	ND		250	204	82	250	216	86	6	78-120/15
108-88-3	Toluene	ND		250	209	84	250	222	89	6	80-120/14
<hr/>											
CAS No.	Surrogate Recoveries	MS	MSD	FA50426-7		Limits					
1868-53-7	Dibromofluoromethane	92%	92%			90%		83-118%			
17060-07-0	1,2-Dichloroethane-D4	90%	91%			84%		79-125%			
2037-26-5	Toluene-D8	97%	98%			101%		85-112%			
460-00-4	4-Bromofluorobenzene	91%	93%			97%		83-118%			

\* = Outside of Control Limits.

6.3.10  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50523-21MS	P54773.D	5	12/30/17	SP	n/a	n/a	VP2078
FA50523-21MSD	P54774.D	5	12/30/17	SP	n/a	n/a	VP2078
FA50523-21 <sup>a</sup>	P54776.D	5	12/30/17	SP	n/a	n/a	VP2078

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-30

CAS No.	Compound	FA50523-21		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
108-88-3	Toluene	ND		125	90.1	72*	125	113	90	23*	80-120/14
CAS No.	Surrogate Recoveries	MS	MSD	FA50523-21 Limits							
1868-53-7	Dibromofluoromethane	93%	94%	93%		83-118%					
17060-07-0	1,2-Dichloroethane-D4	90%	92%	89%		79-125%					
2037-26-5	Toluene-D8	100%	99%	100%		85-112%					
460-00-4	4-Bromofluorobenzene	93%	94%	94%		83-118%					

(a) Confirmation run.

\* = Outside of Control Limits.

6.3.11  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 3

Job Number: FA50344  
 Account: UNIVAR Univar  
 Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50305-2MS	M0100675.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2MSD	M0100676.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2 <sup>a</sup>	M0100655.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

CAS No.	Compound	FA50305-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
67-64-1	Acetone	ND		625	644	103	625	727	116	12	50-147/21
71-43-2	Benzene	ND		125	125	100	125	132	106	5	81-122/14
108-86-1	Bromobenzene	ND		125	111	89	125	118	94	6	80-121/14
74-97-5	Bromochloromethane	ND		125	127	102	125	137	110	8	76-123/14
75-27-4	Bromodichloromethane	ND		125	122	98	125	134	107	9	79-123/19
75-25-2	Bromoform	ND		125	90.0	72	125	100	80	11	66-123/21
78-93-3	2-Butanone (MEK)	ND		625	652	104	625	732	117	12	56-143/18
104-51-8	n-Butylbenzene	ND		125	104	83	125	114	91	9	79-126/16
135-98-8	sec-Butylbenzene	ND		125	114	91	125	122	98	7	83-133/16
98-06-6	tert-Butylbenzene	ND		125	106	85	125	114	91	7	80-133/16
75-15-0	Carbon Disulfide	ND		125	96.4	77	125	102	82	6	66-148/23
56-23-5	Carbon Tetrachloride	ND		125	126	101	125	136	109	8	76-136/23
108-90-7	Chlorobenzene	ND		125	112	90	125	118	94	5	82-124/14
75-00-3	Chloroethane	ND		125	177	142	125	177	142	0	62-144/20
67-66-3	Chloroform	ND		125	122	98	125	131	105	7	80-124/15
95-49-8	o-Chlorotoluene	ND		125	109	87	125	115	92	5	81-127/15
106-43-4	p-Chlorotoluene	ND		125	108	86	125	115	92	6	83-130/15
124-48-1	Dibromochloromethane	ND		125	108	86	125	112	90	4	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		125	97.6	78	125	106	85	8	64-123/18
106-93-4	1,2-Dibromoethane	ND		125	117	94	125	126	101	7	75-120/13
75-71-8	Dichlorodifluoromethane	ND		125	136	109	125	138	110	1	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		125	108	86	125	116	93	7	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		125	112	90	125	119	95	6	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		125	110	88	125	116	93	5	78-120/15
75-34-3	1,1-Dichloroethane	221	E	125	324	82	125	326	84	1	81-122/15
107-06-2	1,2-Dichloroethane	ND		125	121	97	125	129	103	6	75-125/14
75-35-4	1,1-Dichloroethylene	4.6		125	132	102	125	137	106	4	78-137/18
156-59-2	cis-1,2-Dichloroethylene	13.0		125	142	103	125	149	109	5	78-120/15
156-60-5	trans-1,2-Dichloroethylene	0.70	J	125	128	102	125	136	108	6	76-127/17
78-87-5	1,2-Dichloropropane	ND		125	123	98	125	135	108	9	76-124/14
142-28-9	1,3-Dichloropropane	ND		125	104	83	125	111	89	7	80-118/13
594-20-7	2,2-Dichloropropane	ND		125	101	81	125	110	88	9	74-139/17
563-58-6	1,1-Dichloropropene	ND		125	120	96	125	128	102	6	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		125	93.2	75	125	105	84	12	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		125	88.3	71*	125	97.2	78*	10	80-120/22
100-41-4	Ethylbenzene	ND		125	113	90	125	121	97	7	81-121/14

\* = Outside of Control Limits.

6.3.12  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 3

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50305-2MS	M0100675.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2MSD	M0100676.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2 <sup>a</sup>	M0100655.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-32

CAS No.	Compound	FA50305-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
87-68-3	Hexachlorobutadiene	ND		125	106	85	125	112	90	6	75-142/19
591-78-6	2-Hexanone	ND		625	581	93	625	649	104	11	61-129/18
98-82-8	Isopropylbenzene	ND		125	123	98	125	130	104	6	83-132/15
99-87-6	p-Isopropyltoluene	ND		125	114	91	125	121	97	6	79-130/16
74-83-9	Methyl Bromide	ND		125	158	126	125	159	127	1	59-143/19
74-87-3	Methyl Chloride	ND		125	142	114	125	144	115	1	50-159/19
74-95-3	Methylene Bromide	ND		125	128	102	125	138	110	8	78-119/14
75-09-2	Methylene Chloride	ND		125	125	100	125	133	106	6	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		625	605	97	625	674	108	11	66-122/16
91-20-3	Naphthalene	ND		125	115	92	125	117	94	2	63-132/25
103-65-1	n-Propylbenzene	ND		125	107	86	125	115	92	7	82-133/15
100-42-5	Styrene	ND		125	112	90	125	121	97	8	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	ND		125	119	95	125	124	99	4	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	ND		125	113	90	125	120	96	6	72-120/14
127-18-4	Tetrachloroethylene	0.51	J	125	117	93	125	126	100	7	76-135/16
108-88-3	Toluene	ND		125	112	90	125	121	97	8	80-120/14
87-61-6	1,2,3-Trichlorobenzene	ND		125	105	84	125	114	91	8	68-131/25
120-82-1	1,2,4-Trichlorobenzene	ND		125	109	87	125	114	91	4	73-129/20
71-55-6	1,1,1-Trichloroethane	ND		125	118	94	125	128	102	8	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		125	110	88	125	118	94	7	76-119/14
79-01-6	Trichloroethylene	3.7		125	131	102	125	143	111	9	81-126/15
75-69-4	Trichlorofluoromethane	ND		125	162	130	125	166	133	2	71-156/21
96-18-4	1,2,3-Trichloropropane	ND		125	107	86	125	112	90	5	77-120/16
95-63-6	1,2,4-Trimethylbenzene	ND		125	107	86	125	117	94	9	79-120/18
108-67-8	1,3,5-Trimethylbenzene	ND		125	113	90	125	120	96	6	79-120/19
75-01-4	Vinyl Chloride	ND		125	141	113	125	147	118	4	69-159/18
	m,p-Xylene	ND		250	224	90	250	241	96	7	79-126/15
95-47-6	o-Xylene	ND		125	111	89	125	118	94	6	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50305-2	Limits
1868-53-7	Dibromofluoromethane	108%	106%	106%	83-118%
17060-07-0	1,2-Dichloroethane-D4	97%	96%	93%	79-125%
2037-26-5	Toluene-D8	92%	92%	91%	85-112%
460-00-4	4-Bromofluorobenzene	102%	98%	101%	83-118%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 3 of 3

Job Number: FA50344  
Account: UNIVAR Univar  
Project: ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50305-2MS	M0100675.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2MSD	M0100676.D	5	12/30/17	WV	n/a	n/a	VM4328
FA50305-2 <sup>a</sup>	M0100655.D	1	12/30/17	WV	n/a	n/a	VM4328

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50344-32

(a) Sample re-analyzed beyond hold time; reported results are considered minimum values.

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\* = Outside of Control Limits.

6.3.12  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** FA50344  
**Account:** UNIVAR Univar  
**Project:** ERMORP:Groundwater Sampling-3950 NW Yeon Avenue, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50582-2MS	P54914.D	1000	01/08/18	AJ	n/a	n/a	VP2083
FA50582-2MSD	P54915.D	1000	01/08/18	AJ	n/a	n/a	VP2083
FA50582-2	P54903.D	1000	01/08/18	AJ	n/a	n/a	VP2083

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50344-6, FA50344-7

CAS No.	Compound	FA50582-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-00-3	Chloroethane	ND		25000	28100	112	25000	29400	118	5	62-144/20
156-59-2	cis-1,2-Dichloroethylene	55100		25000	74500	78	25000	75000	80	1	78-120/15
540-59-0	1,2-Dichloroethene (total)	55100		50000	99000	88	50000	100000	90	1	77-122/15

CAS No.	Surrogate Recoveries	MS	MSD	FA50582-2	Limits
1868-53-7	Dibromofluoromethane	99%	100%	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	107%	108%	101%	79-125%
2037-26-5	Toluene-D8	100%	101%	102%	85-112%
460-00-4	4-Bromofluorobenzene	92%	93%	99%	83-118%

\* = Outside of Control Limits.

6.3.13

# Memorandum

Environmental  
Resources  
Management

To: Tanya Battye

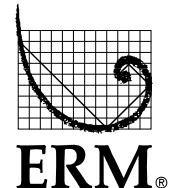
1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)  
[www.erm.com](http://www.erm.com)

From: Rachel James

Date: 15 January 2018

Subject: Data Review of Univar Portland NW Yeon  
Groundwater Samples Collected 13-15 December  
2017

Project Number: 0436528



**Data Packages:** SGS Accutest Data Package FA50344

---

The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017.

## **HOLDING TIME AND PRESERVATION EVALUATION**

The samples were prepared and analyzed within the method-prescribed time period from the date of collection with the exceptions noted in Table 1. Several samples exceeded the 14 day holding time for 1,4-dioxane analysis by 8260B SIM. The associated results were qualified as estimated with a low bias (J-) with the exception of samples SMW-38-20171214 and SMW-37-20171214. These samples were qualified as estimated with no bias (J) due to additional surrogate or internal standard qualifications. Additionally, several samples for VOC analysis by 8260B required multiple dilutions due to the high concentration of target analytes. The affected results have been qualified as estimates with a low bias (J-/UJ), with the exception of the nondetected chloroethane result for sample SMW-21-20171213. This result was rejected (R) due to the gross holding time exceedance (12 days). Qualifications were not necessary due to the holding time exceedance of a non-project MS/MSD parent sample.

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C. No qualifications were necessary. The laboratory noted that 8260B sample PZ-12-20171215 for toluene was analyzed with significant headspace in the VOA vial due to multiple dilutions. The toluene result for this sample was qualified as an estimate with a low bias (J-) due to the headspace. Additionally, the laboratory described that several non-project MS/MSD parent samples were analyzed with a pH greater than the method

requirement of 2. Qualifications were not necessary due to the preservation exceedances of non-project MS/MSD parent samples. Data associated with exceeded preservation requirements are listed in Table 2.

### ***BLANK EVALUATION***

The method, field, and trip blank sample results were nondetected for each of the target analytes, with two exceptions. Hexachlorobutadiene was detected at concentrations below the reporting limit in two method blank samples; however, this analyte was nondetected in associated samples and qualifications were not necessary. The method blank detections are presented in Table 3.

### ***CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION***

The continuing calibration verification (CCV) recoveries were within the laboratory's limits of acceptance with several exceptions. CCV recoveries for 2-hexanone, chloroethane, methyl chloride, and acetone were above the control limits; however, these analytes were nondetected in associated samples and qualifications were not necessary. Additionally, a CCV recovery for hexachlorobutadiene was below the control limit. The associated sample results were nondetected and were qualified as estimates (UJ) due to the low recovery. The CCVs that did not meet control limits are presented in Table 4.

### ***BLANK SPIKE EVALUATION***

The laboratory control samples (LCS) were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

### ***MATRIX SPIKE EVALUATION***

The matrix spike (MS)/matrix spike duplicate (MSD) recoveries and RPDs were within laboratory limits of acceptance with several exceptions. No data were qualified if the outlier was from a non-project sample, if the outlier can be verified by an in-control result, or if the sample result was greater than four times the spike concentration. Remaining affected sample results were qualified as estimated with a low or high bias (J- or

J+) due to low or high MS/MSD recoveries. The outliers and associated qualifications can be found in Table 5.

### **SURROGATE SPIKE EVALUATION**

The surrogate recoveries were within acceptable limits with one exception. Surrogate toluene-d8 was recovered above the control limit in 8260B SIM analysis for sample SMW-38-20171214. The associated 1,4-dioxane result was flagged as estimated (J) with no bias due to additional holding time qualification. The surrogate spike outside control limits and associated sample data are provided in Table 6.

### **CALIBRATION RANGE EXCEEDANCES**

The cis-1,2-dichloroethylene results in sample SMW-38-20171214 and the MS/MSD samples prepared from it exceeded the instrument calibration range. The laboratory reported the parent sample result from a different run and qualifications were not necessary. Additionally, the 1,1-dichloroethane results in a batch MS/MSD sample exceeded the instrument calibration range. Since the MS/MSD parent sample is not from this project, no qualifications were applied. Data associated with calibration range exceedances are presented in Table 7.

### **INTERNAL STANDARD EVALUATION**

The internal standard recoveries were within acceptable limits, with the exception noted in Table 8. The laboratory described that the internal standard recovery in method 8260B SIM for sample SMW-37-20171214 was outside control limits, but a high or low bias was not specified. The associated 1,4-dioxane result was qualified as estimated (J) due to the internal standard recovery.

### **FIELD DUPLICATE EVALUATION**

Three samples were submitted in duplicate. ERM calculated the relative percent differences (RPDs) between detected results in Table 9. The USEPA has not established control criteria for field duplicate samples;

therefore, sample data are not qualified on the basis of field duplicate imprecision.

### **OVERALL ASSESSMENT**

The chloroethane result for sample SMW-21-20171213 was determined to be unusable due gross exceedance of the holding time. With exception of this rejected result, all of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically-defensible documents.

**Table 1**  
**Samples with Exceeded Holding Times**  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Method	Extraction Holding Time	# of Days Exceeded	Analysis Holding Time	Time Exceeded	ERM Qualifier
FA50344	SMW-11-20171213	8260B SIM	--	--	14 days	2 days	J-
	PZ-06-20171213	8260B SIM	--	--	14 days	2 days	J-
	SMW-26-20171213	8260B SIM	--	--	14 days	2 days	J-
	SMW-06-20171213	8260B SIM	--	--	14 days	2 days	J-
	SMW-38-20171214	8260B SIM	--	--	14 days	1 day	J
	SMW-37-20171214	8260B SIM	--	--	14 days	1 day	J
	EXW-3A-20171214	8260B SIM	--	--	14 days	1 day	J-
	DMW-08-20171213	cis-1,2-Dichloroethylene and 1,2-Dichloroethene (total) only	--	--	14 days	12 days	J-
	SMW-21-20171213	8260B Chloroethane only	--	--	14 days	12 days	R
	SMW-38-20171214	8260B 1,1,1-Trichloroethane only	--	--	14 days	1 day	J-
	PZ-12-20171215	8260B Toluene only	--	--	14 days	1 day	J-
	SMW-08-20171215	8260B All VOCs	--	--	14 days	1 day	J-/UJ
	Batch MS/MSD Sample FA50305-2	8260B All VOCs	--	--	14 days	NC	--

Lab report reviewed: FA50344

**Key:**

J = Estimated detected result

J- = Detected results are estimated with a low bias

J-/UJ = Detected results are estimated with low bias; nondetected results are estimated at the report limit

NC = Not calculated due to insufficient information

R = Result is rejected

**Table 2**  
*Samples with Exceeded Preservation Requirements*  
**Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Analysis Method	Preservation Condition	Limits	ERM Qualifier
FA50344	PZ-12-20171215 Toluene only	8260B	Significant headspace	No headspace	J-
	Batch MS/MSD Sample FA50455-6	8260B	pH > 2	pH < 2	--
	Batch MS/MSD Sample FA50492-1	8260B	pH > 2	pH < 2	--
	Batch MS/MSD Sample FA50381-3	8260B	pH > 2	pH < 2	--

Lab report reviewed: FA50344

**Key:**

J- = Detected results are estimated with a low bias

*Table 3*  
*Blank and Associated Suspect Sample Detections*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Blank ID	Associated Samples	Detected Compound	Reported Concentration	Report Limit	Units	ERM Qualifier
FA50344	VI1526-MB	--	Hexachlorobutadiene	0.40	2.0	µg/L	--
	VI1530-MB	--	Hexachlorobutadiene	0.46	2.0	µg/L	--

Lab report reviewed: FA50344

**Key:**

µg/L = Micrograms per liter

**Table 4**  
*Calibration Verification Recoveries Outside of Acceptable Limits*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Associated Sample	Compound	CCV Recovery	Reported Concentration	Units	ERM Qualifier
FA50344	Batch VI1526 CCV	--	2-Hexanone	High	--	--	--
		--	Chloroethane	High	--	--	--
	Batch VI1530 CCV	--	Methyl Chloride	High	--	--	--
	Batch VM4322 CCV	--	Acetone Hexachlorobutadiene	High	--	--	--
	Batch VP2071 CCV	See below		Low	--	--	--
	--	TRIP-1		--	ND	µg/L	UJ
	--	SMW-11-20171213		--	ND	µg/L	UJ
	--	PZ-06-20171213		--	ND	µg/L	UJ
	--	SMW-03-20171213		--	ND	µg/L	UJ
	--	SMW-40-20171213		--	ND	µg/L	UJ

Lab report reviewed: FA50344

**Key:**

CCV = Continuing calibration verification

High = CCV above maximum acceptable limit

Low = CCV below maximum acceptable limit

µg/L = Micrograms per liter

UJ = Nondetected, estimated report limit

**Table 5**  
**Spike Recoveries Outside of Acceptable Limits**  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
MS/MSD										
			Dichlorodifluoromethane	25/77	42-167	103	19	--	--	--
FA50344	Batch MS/MSD Sample FA50381-4	--	Hexachlorobutadiene	74/79	75-142	7	19	--	--	--
		--	Chloroethane	165/144	62-144	13	20	--	--	--
	SMW-26-20171213 MS/MSD	SMW-26-20171213	1,1-Dichloroethane	133/138	81-122	4	15	129	µg/L	J+
			1,1-Dichloroethylene	147/152	78-137	3	18	199	µg/L	J+
			cis-1,2-Dichloroethylene	324/332	78-120	2	15	1310	µg/L	J+
			Trichloroethylene	124/128	81-126	3	15	--	--	--
			Vinyl Chloride	238/239	69-159	1	18	854	µg/L	J+
	Batch MS/MSD Sample FA50492-1	--	Bromoform	65/62	66-123	5	21	--	--	--
		--	cis-1,3-Dichloropropene	72/72	75-118	0	23	--	--	--
		--	trans-1,3-Dichloropropene	68/62	80-120	9	22	--	--	--
	Batch MS/MSD Sample FA50381-3	--	Chloroethane	154/143	62-144	7	20	--	--	--
		--	1,4-Dichlorobenzene	100/86	78-120	16	15	--	--	--
		--	1,3-Dichloropropane	90/79	80-118	13	13	--	--	--
		--	1,2,3-Trichloropropane	101/85	77-120	17	16	--	--	--
	SMW-38-20171214 MS/MSD	SMW-38-20171214	1,1-Dichloroethane	82/74	81-122	4	15	--	--	--
			cis-1,2-Dichloroethylene	1/-19	78-120	4	15	4X	--	--
			cis-1,3-Dichloropropene	75/74	75-118	2	23	--	--	--
			Ethylbenzene	82/78	81-121	3	14	--	--	--
			Styrene	79/77	78-119	3	23	--	--	--
			Tetrachloroethylene	41/29	76-135	5	16	2580	µg/L	J-
			Toluene	16/3	80-120	4	14	4390	µg/L	J-
			Trichloroethylene	19/3	81-126	5	15	4060	µg/L	J-
			Vinyl Chloride	46/41	69-159	2	18	1990	µg/L	J-

**Table 5**  
*Spike Recoveries Outside of Acceptable Limits*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
FA50344	Batch MS/MSD Sample FA50523-21	--	Toluene	72/90	80-120	23	14	--	--	--
	Batch MS/MSD Sample FA50305-2	--	trans-1,3-Dichloropropene	71/78	80-120	10	22	--	--	--

Lab report reviewed: FA50344

**Key:**

4X = The unspiked sample result was greater than four times the spike concentration

Batch = Spike sample was prepared using non-client sample

J- = Estimated detection with low bias

J+ = Detected results are estimated with a high bias

MS/MSD - Matrix spike/matrix spike duplicate

RPD = Relative percent difference

µg/L = Micrograms per liter

**Table 6**  
*Surrogate Recovery Results out of Acceptable Limits*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Method	Surrogate	Recovery (%)	Limit (%)	Affected Analytes	Note	ERM Qualifier
FA50344	SMW-38-20171214	8260B SIM	Toluene-D8	112	88-111	1,4-Dioxane	DF = 5	J

Lab report reviewed: FA50344

**Key:**

DF = Dilution factor

J = Estimated detected result

**Table 7**  
**Calibration Range Exceedances**  
**Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier
FA50344	SMW-38-20171214 MS/MSD	cis-1,2-Dichloroethylene	Sample: 6290 MS: 6300 MSD: 6050	µg/L	--
	Batch MS/MSD Sample FA50305-2	1,1-Dichloroethane	Sample: 221 MS: 324 MSD: 326	µg/L	--

Lab report reviewed: FA50344

**Key:**

µg/L = Micrograms per liter

**Table 8**  
*Internal Standard Recoveries Outside of Acceptable Limits*  
*Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Analysis Method	Internal Standard Recovery	Affected Analyte	Reported Concentration	Units	ERM Qualifier
FA50344	SMW-37-20171214	8260B SIM	Out	1,4-Dioxane	6.8	µg/L	J

Lab report reviewed: FA50344

**Key:**

J = Estimated detected result

Out = Internal standard outside acceptable limits (high/low unspecified)

µg/L = Micrograms per liter

**Table 9**  
**Field Duplicate Results and Calculated Relative Percent Differences**  
**Groundwater Samples Collected at Univar NW Yeon Facility, 13-15 December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Primary/ Duplicate Sample ID	Compound	Concentration		Report Limit		Units	RPD
			Sample	Duplicate	Sample	Duplicate		
FA50344	SMW-12-20171213/ SMW-12-20171213-D1	cis-1,2-Dichloroethylene	22.7	22.8	1.0	1.0	µg/L	0.4
		Trichloroethylene	3.8	4.1	1.0	1.0	µg/L	7.6
		Vinyl Chloride	9.9	10.1	1.0	1.0	µg/L	2.0
	EXW-3A-20171214/ EXW-3A-20171214-D2  EXW-02-20171215/ EXW-02-20171215-D3	cis-1,2-Dichloroethylene	3.6	3.6	1.0	1.0	µg/L	0.0
		Benzene	3.0	3.2	2.5	2.5	µg/L	6.5
		Chloroethane	14.9	14.5	5.0	5.0	µg/L	2.7
		1,2-Dichlorobenzene	2.9	2.8	2.5	2.5	µg/L	3.5
		1,1-Dichloroethane	21.3	20.8	2.5	2.5	µg/L	2.4
		1,1-Dichloroethylene	12.5	12.2	2.5	2.5	µg/L	2.4
		cis-1,2-Dichloroethylene	179	183	2.5	2.5	µg/L	2.2
		1,1,1-Trichloroethane	4.9	5.3	2.5	2.5	µg/L	7.8
		Trichloroethylene	4.0	3.9	2.5	2.5	µg/L	2.5
		Vinyl Chloride	34.2	33.9	2.5	2.5	µg/L	0.9
		o-Xylene	3.5	3.5	2.5	2.5	µg/L	0.0

Lab report reviewed: FA50344

**Key:**

RPD = Relative percent difference

µg/L = Micrograms per liter

The results set forth herein are provided by SGS North America Inc.

**e-Hardcopy 2.0**  
*Automated Report*

Technical Report for

Univar

ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
S074

SGS Job Number: FA50605

Sampling Date: 12/29/17



Report to:

ERM  
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Portland, OR 97204  
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ATTN: Brendan Robinson

Total number of pages in report: **34**



Test results contained within this data package meet the requirements  
of the National Environmental Laboratory Accreditation Program  
and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Elvin Kumar 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
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Test results relate only to samples analyzed.

# Table of Contents

-1-

<b>Section 1: Sample Summary .....</b>	<b>3</b>
<b>Section 2: Case Narrative/Conformance Summary .....</b>	<b>4</b>
<b>Section 3: Summary of Hits .....</b>	<b>6</b>
<b>Section 4: Sample Results .....</b>	<b>7</b>
<b>4.1: FA50605-1: W-1-20171229 .....</b>	<b>8</b>
<b>4.2: FA50605-2: W-2-20171229 .....</b>	<b>10</b>
<b>4.3: FA50605-3: TRIP BLANK .....</b>	<b>13</b>
<b>Section 5: Misc. Forms .....</b>	<b>15</b>
<b>5.1: Chain of Custody .....</b>	<b>16</b>
<b>Section 6: MS Volatiles - QC Data Summaries .....</b>	<b>18</b>
<b>6.1: Method Blank Summary .....</b>	<b>19</b>
<b>6.2: Blank Spike Summary .....</b>	<b>23</b>
<b>6.3: Matrix Spike/Matrix Spike Duplicate Summary .....</b>	<b>27</b>
<b>Section 7: General Chemistry - QC Data Summaries .....</b>	<b>31</b>
<b>7.1: Method Blank and Spike Results Summary .....</b>	<b>32</b>
<b>7.2: Matrix Spike Results Summary .....</b>	<b>33</b>
<b>7.3: Matrix Spike Duplicate Results Summary .....</b>	<b>34</b>

## Sample Summary

Univar

Job No: FA50605

ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR  
Project No: S074

Sample Number	Collected Date	Time By	Matrix Received	Code Type	Client Sample ID
FA50605-1	12/29/17	07:45 LM	12/30/17	AQ Water	W-1-20171229
FA50605-2	12/29/17	07:57 LM	12/30/17	AQ Water	W-2-20171229
FA50605-3	12/29/17	00:00 LM	12/30/17	AQ Trip Blank Water	TRIP BLANK



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Univar

**Job No:** FA50605

**Site:** ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR **Report Date:** 1/10/2018 3:40:26 PM

2 Sample(s), 1 Trip Blank(s) were collected on 12/29/2017 and were received at SGS Orlando on 12/30/2017 properly preserved, at 2.8 Deg. C and intact. These Samples received an SGS Orlando job number of FA50605. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** AQ

**Batch ID:** VJ5793

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50526-4MS, FA50526-4MSD were used as the QC samples indicated.

**Matrix:** AQ

**Batch ID:** VN4929

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50557-2MS, FA50557-2MSD were used as the QC samples indicated.

Matrix Spike/ Matrix Spike Duplicate/ Recovery(s) for 2-Chloroethyl Vinyl Ether are outside control limits.

Matrix Spike Duplicate Recovery(s) for 1,1-Dichloroethane are outside control limits. Outside control limits due to high level in sample relative to spike amount.

Matrix Spike/Matrix Spike Duplicate Recovery(s) for 1,1-Dichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

FA50605-1: Sample was not preserved to a pH < 2.

FA50605-1 for Acrolein: Associated CCV outside of control limits high, sample was ND.

FA50605-1: Sample was not preserved to a pH < 2.

FA50605-1 for Acrolein: Associated CCV outside of control limits high, sample was ND.

FA50605-2 for Acrolein: Associated CCV outside of control limits high, sample was ND.

FA50605-3 for Acrolein: Associated CCV outside of control limits high, sample was ND.

FA50605-2: Sample was not preserved to a pH < 2.

FA50605-3: Sample was not preserved to a pH < 2.

### General Chemistry By Method EPA 1664A

**Matrix:** AQ

**Batch ID:** GP30916

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50525-2MS were used as the QC samples for HEM Oil and Grease.

### General Chemistry By Method EPA 335.4/SW 9012B

**Matrix:** AQ

**Batch ID:** GP30930

All samples were prepped within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50605-2MSD, FA50605-2MS were used as the QC samples for Cyanide, Total.

Matrix Spike Recovery(s) for Cyanide, Total are outside control limits. Spike recovery indicates possible matrix interference.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

---

Kim Benham, Client Services (signature on file)

## Summary of Hits

Page 1 of 1

Job Number: FA50605

Account: Univar

Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Collected: 12/29/17

3

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

### FA50605-1 W-1-20171229

Benzene <sup>a</sup>	1.4	1.0	0.31	ug/l	SW846 8260B
Chloroethane	42.8	2.0	0.67	ug/l	SW846 8260B
1,2-Dichlorobenzene <sup>a</sup>	0.49 J	1.0	0.32	ug/l	SW846 8260B
1,1-Dichloroethane <sup>a</sup>	13.2	1.0	0.34	ug/l	SW846 8260B
1,1-Dichloroethylene <sup>a</sup>	0.70 J	1.0	0.32	ug/l	SW846 8260B
cis-1,2-Dichloroethylene <sup>a</sup>	28.9	1.0	0.28	ug/l	SW846 8260B
trans-1,2-Dichloroethylene <sup>a</sup>	0.42 J	1.0	0.22	ug/l	SW846 8260B
Ethylbenzene <sup>a</sup>	22.7	1.0	0.36	ug/l	SW846 8260B
Toluene <sup>a</sup>	4.4	1.0	0.30	ug/l	SW846 8260B
1,1,1-Trichloroethane <sup>a</sup>	4.9	1.0	0.25	ug/l	SW846 8260B
Vinyl Chloride <sup>a</sup>	31.1	1.0	0.41	ug/l	SW846 8260B
m,p-Xylene <sup>a</sup>	31.9	2.0	0.47	ug/l	SW846 8260B
o-Xylene <sup>a</sup>	12.1	1.0	0.26	ug/l	SW846 8260B

### FA50605-2 W-2-20171229

No hits reported in this sample.

### FA50605-3 TRIP BLANK

No hits reported in this sample.

(a) Sample was not preserved to a pH < 2.



Orlando, FL

**Section 4**

4

## Sample Results

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### Report of Analysis

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**Report of Analysis**

Page 1 of 2

<b>Client Sample ID:</b>	W-1-20171229	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-1	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1 <sup>a</sup>	N0107859.D	1	01/04/18 15:13	WV	n/a	n/a	VN4929
Run #2	J0988638.D	1	01/03/18 18:42	MM	n/a	n/a	VJ5793

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein <sup>b</sup>	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	1.4	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	42.8 <sup>c</sup>	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.49	1.0	0.32	ug/l	J
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	13.2	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.70	1.0	0.32	ug/l	J
156-59-2	cis-1,2-Dichloroethylene	28.9	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.42	1.0	0.22	ug/l	J
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	22.7	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-1-20171229	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-1	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	4.4	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	4.9	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	31.1	1.0	0.41	ug/l	
	m,p-Xylene	31.9	2.0	0.47	ug/l	
95-47-6	o-Xylene	12.1	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	100%	106%	79-125%
2037-26-5	Toluene-D8	96%	95%	85-112%
460-00-4	4-Bromofluorobenzene	99%	95%	83-118%

- (a) Sample was not preserved to a pH < 2.  
 (b) Associated CCV outside of control limits high, sample was ND.  
 (c) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 2

4.2  
4**Client Sample ID:** W-2-20171229**Lab Sample ID:** FA50605-2**Date Sampled:** 12/29/17**Matrix:** AQ - Water**Date Received:** 12/30/17**Method:** SW846 8260B**Percent Solids:** n/a**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988639.D	1	01/03/18 19:06	MM	n/a	n/a	VJ5793
Run #2 <sup>a</sup>	N0107860.D	1	01/04/18 15:38	WV	n/a	n/a	VN4929

**Purge Volume**

Run #1 5.0 ml

Run #2 5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein <sup>b</sup>	ND <sup>c</sup>	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND <sup>c</sup>	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND <sup>c</sup>	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 2 of 2

<b>Client Sample ID:</b>	W-2-20171229	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-2	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	108%	100%	79-125%
2037-26-5	Toluene-D8	92%	96%	85-112%
460-00-4	4-Bromofluorobenzene	97%	100%	83-118%

- (a) Sample was not preserved to a pH < 2.  
 (b) Associated CCV outside of control limits high, sample was ND.  
 (c) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

Page 1 of 1

<b>Client Sample ID:</b>	W-2-20171229	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-2	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**General Chemistry**

Analyte	Result	RL	MDL	Units	DF	Analyzed	By Method
Cyanide, Total	0.0030 U	0.010	0.0030	mg/l	1	01/09/18 17:20 VK	EPA 335.4/SW 9012B
HEM Oil and Grease	1.5 U	5.4	1.5	mg/l	1	01/04/18 13:00 CH	EPA 1664A

4.2  
4

RL = Reporting Limit  
 MDL = Method Detection Limit

U = Indicates a result < MDL  
 J = Indicates a result > = MDL but < RL

**Report of Analysis**

Page 1 of 2

4.3  
4

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-3	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

	<b>File ID</b>	<b>DF</b>	<b>Analyzed</b>	<b>By</b>	<b>Prep Date</b>	<b>Prep Batch</b>	<b>Analytical Batch</b>
Run #1	J0988640.D	1	01/03/18 19:30	MM	n/a	n/a	VJ5793
Run #2 <sup>a</sup>	N0107861.D	1	01/04/18 16:01	WV	n/a	n/a	VN4929

<b>Purge Volume</b>	
Run #1	5.0 ml
Run #2	5.0 ml

**VOA Special List**

<b>CAS No.</b>	<b>Compound</b>	<b>Result</b>	<b>RL</b>	<b>MDL</b>	<b>Units</b>	<b>Q</b>
107-02-8	Acrolein <sup>b</sup>	ND <sup>c</sup>	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND <sup>c</sup>	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND <sup>c</sup>	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Report of Analysis**

<b>Client Sample ID:</b>	TRIP BLANK	<b>Date Sampled:</b>	12/29/17
<b>Lab Sample ID:</b>	FA50605-3	<b>Date Received:</b>	12/30/17
<b>Matrix:</b>	AQ - Trip Blank Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	ERMOPR: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR		

**VOA Special List**

CAS No.	Compound	Result	RL	MDL	Units	Q
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	109%	99%	79-125%
2037-26-5	Toluene-D8	97%	97%	85-112%
460-00-4	4-Bromofluorobenzene	97%	99%	83-118%

- (a) Sample was not preserved to a pH < 2.  
 (b) Associated CCV outside of control limits high, sample was ND.  
 (c) Result is from Run# 2

ND = Not detected      MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

**Misc. Forms****5****Custody Documents and Other Forms**

Includes the following where applicable:

- Chain of Custody



Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/889-3716 Fax 425/889-4188

Univar Chain of Custody/Laboratory Analysis Request Form

Page 1 of 1

FA50605

BILL TO: Mark Metcalf  
Univar USA  
17425 NE UNION HILL RD  
Redmond WA 98052

Lab Name: Accutech  
Address: Orlando  
Telephone: 407 425 6700

REMARKS:

1 trip blank = 2 preserved  
+ 2 unpreserved VOA's

Univar Project Site:  
PORTLAND, OR (NW YARD) Po #30747

Contractor Project Manager:

BRENDAN ROBESON

Firm: ERM

Address: 1001 SW 5TH AVE, SUITE 1910  
PORTLAND, OR 97204

Tel: (503) 488-5282

Sampler's Signature:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	ACROLEIN + ACETONE + 2CLTE	Cyanoacrylate	V/V CASH
① W-1-20171229	12/29	07:45		Water	6	X	X	
② W-2-20171229	12/29	07:57			9	X	X	
③ Trip Blank					1	X		

Relinquished by/date:

Received by/date:

Relinquished by/date:

# SGS Accutest Sample Receipt Summary

**Job Number:** FA50605      **Client:** UNIVAR/ERM      **Project:** Univar - WTS (NW Yeon)  
**Date / Time Received:** 12/30/2017 10:45:00 AM      **Delivery Method:** FedEx      **Airbill #s:** 7891 5996 8580

**Therm ID:** IR 1;

**Therm CF:** 0.4;

**# of Coolers:** 1

**Cooler Temps (Raw Measured) °C:** Cooler 1: (2.4);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.8);

<b>Cooler Information</b>		<b>Y or N</b>	<b>Sample Information</b>		<b>Y or N</b>	<b>N/A</b>
1. Custody Seals Present		<input checked="" type="checkbox"/> <input type="checkbox"/>	1. Sample labels present on bottles		<input checked="" type="checkbox"/> <input type="checkbox"/>	
2. Custody Seals Intact		<input checked="" type="checkbox"/> <input type="checkbox"/>	2. Samples preserved properly		<input checked="" type="checkbox"/> <input type="checkbox"/>	
3. Temp criteria achieved		<input checked="" type="checkbox"/> <input type="checkbox"/>	3. Sufficient volume/containers recvd for analysis:		<input checked="" type="checkbox"/> <input type="checkbox"/>	
4. Cooler temp verification		IR Gun	4. Condition of sample		Intact	
5. Cooler media		Ice (Bag)	5. Sample recvd within HT		<input checked="" type="checkbox"/> <input type="checkbox"/>	
<b>Trip Blank Information</b>		<b>Y or N</b>	<b>N/A</b>	6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/> <input type="checkbox"/>	
1. Trip Blank present / cooler		<input checked="" type="checkbox"/> <input type="checkbox"/>		7. VOCs have headspace	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	
2. Trip Blank listed on COC		<input checked="" type="checkbox"/> <input type="checkbox"/>		8. Bottles received for unspecified tests	<input type="checkbox"/> <input checked="" type="checkbox"/>	
		<b>W or S</b>	<b>N/A</b>	9. Compositing instructions clear	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>	
3. Type Of TB Received		<input checked="" type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>
				11. % Solids Jar received?	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>
				12. Residual Chlorine Present?	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/>

## Misc. Information

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_

Test Strip Lot #: pH 0-3 \_\_\_\_\_ 230315 \_\_\_\_\_

Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Number of 5035 Field Kits: \_\_\_\_\_

pH 10-12 \_\_\_\_\_ 219813A \_\_\_\_\_

Number of Lab Filtered Metals: \_\_\_\_\_

Other: (Specify) \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: PETERH

Date: 12/30/2017 10:45:00 A

Reviewer: PH

Date: 12/30/2017

**FA50605: Chain of Custody**

**Page 2 of 2**

5.1

**MS Volatiles****QC Data Summaries**

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5793-MB	J0988621.D	1	01/03/18	MM	n/a	n/a	VJ5793

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	

## Method Blank Summary

Page 2 of 2

**Job Number:** FA50605

**Account:** UNIVAR Univar

**Project:** ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5793-MB	J0988621.D	1	01/03/18	MM	n/a	n/a	VJ5793

**The QC reported here applies to the following samples:**

**Method:** SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Result	RL	MDL	Units	Q
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	104%
17060-07-0	1,2-Dichloroethane-D4	107%
2037-26-5	Toluene-D8	99%
460-00-4	4-Bromofluorobenzene	95%

## Method Blank Summary

Page 1 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN4929-MB	N0107853.D	1	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Result	RL	MDL	Units	Q
107-02-8	Acrolein	ND	20	6.1	ug/l	
107-13-1	Acrylonitrile	ND	10	2.1	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
110-75-8	2-Chloroethyl Vinyl Ether	ND	5.0	2.1	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	
76-13-1	Freon 113	ND	1.0	0.48	ug/l	
74-83-9	Methyl Bromide	ND	2.0	0.59	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	

## Method Blank Summary

Page 2 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN4929-MB	N0107853.D	1	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Result	RL	MDL	Units	Q
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	100%
17060-07-0	1,2-Dichloroethane-D4	99%
2037-26-5	Toluene-D8	97%
460-00-4	4-Bromofluorobenzene	100%

## Blank Spike Summary

Page 1 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5793-BS	J0988620.D	1	01/03/18	MM	n/a	n/a	VJ5793

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	25.6	102	81-122
75-27-4	Bromodichloromethane	25	26.3	105	79-123
75-25-2	Bromoform	25	21.7	87	66-123
75-15-0	Carbon Disulfide	25	28.2	113	66-148
56-23-5	Carbon Tetrachloride	25	26.6	106	76-136
108-90-7	Chlorobenzene	25	25.7	103	82-124
75-00-3	Chloroethane	25	25.3	101	62-144
67-66-3	Chloroform	25	25.7	103	80-124
124-48-1	Dibromochloromethane	25	23.6	94	78-122
75-71-8	Dichlorodifluoromethane	25	23.2	93	42-167
95-50-1	1,2-Dichlorobenzene	25	26.3	105	82-124
541-73-1	1,3-Dichlorobenzene	25	27.1	108	84-125
106-46-7	1,4-Dichlorobenzene	25	26.3	105	78-120
75-34-3	1,1-Dichloroethane	25	26.9	108	81-122
107-06-2	1,2-Dichloroethane	25	25.6	102	75-125
75-35-4	1,1-Dichloroethylene	25	26.9	108	78-137
156-59-2	cis-1,2-Dichloroethylene	25	25.4	102	78-120
156-60-5	trans-1,2-Dichloroethylene	25	26.6	106	76-127
78-87-5	1,2-Dichloropropane	25	25.7	103	76-124
10061-01-5	cis-1,3-Dichloropropene	25	24.7	99	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.4	98	80-120
100-41-4	Ethylbenzene	25	25.9	104	81-121
76-13-1	Freon 113	25	25.6	102	72-134
74-83-9	Methyl Bromide	25	19.4	78	59-143
74-87-3	Methyl Chloride	25	22.9	92	50-159
75-09-2	Methylene Chloride	25	27.3	109	69-135
100-42-5	Styrene	25	27.0	108	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	26.3	105	72-120
127-18-4	Tetrachloroethylene	25	26.6	106	76-135
108-88-3	Toluene	25	26.2	105	80-120
71-55-6	1,1,1-Trichloroethane	25	25.9	104	75-130
79-00-5	1,1,2-Trichloroethane	25	25.7	103	76-119
79-01-6	Trichloroethylene	25	26.1	104	81-126
75-69-4	Trichlorofluoromethane	25	28.3	113	71-156
75-01-4	Vinyl Chloride	25	23.8	95	69-159
	m,p-Xylene	50	53.0	106	79-126

\* = Outside of Control Limits.

6.2.1  
6

## Blank Spike Summary

Page 2 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VJ5793-BS	J0988620.D	1	01/03/18	MM	n/a	n/a	VJ5793

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
95-47-6	o-Xylene	25	25.7	103	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	99%	83-118%
17060-07-0	1,2-Dichloroethane-D4	101%	79-125%
2037-26-5	Toluene-D8	99%	85-112%
460-00-4	4-Bromofluorobenzene	98%	83-118%

\* = Outside of Control Limits.

## Blank Spike Summary

Page 1 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN4929-BS	N0107852.D	1	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
107-02-8	Acrolein	125	86.7	69	31-154
107-13-1	Acrylonitrile	125	132	106	58-126
71-43-2	Benzene	25	27.1	108	81-122
75-27-4	Bromodichloromethane	25	27.5	110	79-123
75-25-2	Bromoform	25	27.0	108	66-123
75-15-0	Carbon Disulfide	25	27.2	109	66-148
56-23-5	Carbon Tetrachloride	25	27.4	110	76-136
108-90-7	Chlorobenzene	25	27.0	108	82-124
110-75-8	2-Chloroethyl Vinyl Ether	125	150	120	56-122
67-66-3	Chloroform	25	26.9	108	80-124
124-48-1	Dibromochloromethane	25	27.4	110	78-122
75-71-8	Dichlorodifluoromethane	25	29.0	116	42-167
95-50-1	1,2-Dichlorobenzene	25	26.3	105	82-124
541-73-1	1,3-Dichlorobenzene	25	27.1	108	84-125
106-46-7	1,4-Dichlorobenzene	25	26.7	107	78-120
75-34-3	1,1-Dichloroethane	25	28.8	115	81-122
107-06-2	1,2-Dichloroethane	25	26.7	107	75-125
75-35-4	1,1-Dichloroethylene	25	28.0	112	78-137
156-59-2	cis-1,2-Dichloroethylene	25	27.7	111	78-120
156-60-5	trans-1,2-Dichloroethylene	25	28.4	114	76-127
78-87-5	1,2-Dichloropropane	25	26.8	107	76-124
10061-01-5	cis-1,3-Dichloropropene	25	25.4	102	75-118
10061-02-6	trans-1,3-Dichloropropene	25	27.4	110	80-120
100-41-4	Ethylbenzene	25	27.6	110	81-121
76-13-1	Freon 113	25	25.6	102	72-134
74-83-9	Methyl Bromide	25	22.8	91	59-143
74-87-3	Methyl Chloride	25	26.5	106	50-159
75-09-2	Methylene Chloride	25	26.2	105	69-135
100-42-5	Styrene	25	26.5	106	78-119
79-34-5	1,1,2,2-Tetrachloroethane	25	27.8	111	72-120
127-18-4	Tetrachloroethylene	25	28.8	115	76-135
108-88-3	Toluene	25	27.6	110	80-120
71-55-6	1,1,1-Trichloroethane	25	26.7	107	75-130
79-00-5	1,1,2-Trichloroethane	25	26.8	107	76-119
79-01-6	Trichloroethylene	25	27.9	112	81-126
75-69-4	Trichlorofluoromethane	25	29.9	120	71-156

\* = Outside of Control Limits.

6.2.2  
6

## Blank Spike Summary

Page 2 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VN4929-BS	N0107852.D	1	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
75-01-4	Vinyl Chloride	25	27.7	111	69-159
	m,p-Xylene	50	56.0	112	79-126
95-47-6	o-Xylene	25	26.8	107	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	79-125%
2037-26-5	Toluene-D8	99%	85-112%
460-00-4	4-Bromofluorobenzene	102%	83-118%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** FA50605  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50526-4MS	J0988643.D	10	01/03/18	MM	n/a	n/a	VJ5793
FA50526-4MSD	J0988644.D	10	01/03/18	MM	n/a	n/a	VJ5793
FA50526-4	J0988641.D	10	01/03/18	MM	n/a	n/a	VJ5793

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	FA50526-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	10 U	250	252	101	250	252	101	0	81-122/14	
75-27-4	Bromodichloromethane	10 U	250	248	99	250	245	98	1	79-123/19	
75-25-2	Bromoform	10 U	250	187	75	250	188	75	1	66-123/21	
75-15-0	Carbon Disulfide	20 U	250	204	82	250	195	78	5	66-148/23	
56-23-5	Carbon Tetrachloride	10 U	250	251	100	250	252	101	0	76-136/23	
108-90-7	Chlorobenzene	10 U	250	253	101	250	261	104	3	82-124/14	
75-00-3	Chloroethane	20 U	250	223	89	250	241	96	8	62-144/20	
67-66-3	Chloroform	10 U	250	254	102	250	252	101	1	80-124/15	
124-48-1	Dibromochloromethane	10 U	250	212	85	250	214	86	1	78-122/19	
75-71-8	Dichlorodifluoromethane	20 U	250	222	89	250	215	86	3	42-167/19	
95-50-1	1,2-Dichlorobenzene	10 U	250	260	104	250	258	103	1	82-124/14	
541-73-1	1,3-Dichlorobenzene	10 U	250	270	108	250	263	105	3	84-125/14	
106-46-7	1,4-Dichlorobenzene	10 U	250	250	100	250	250	100	0	78-120/15	
75-34-3	1,1-Dichloroethane	10 U	250	270	108	250	264	106	2	81-122/15	
107-06-2	1,2-Dichloroethane	10 U	250	255	102	250	253	101	1	75-125/14	
75-35-4	1,1-Dichloroethylene	10 U	250	264	106	250	263	105	0	78-137/18	
156-59-2	cis-1,2-Dichloroethylene	10 U	250	253	101	250	258	103	2	78-120/15	
156-60-5	trans-1,2-Dichloroethylene	10 U	250	266	106	250	258	103	3	76-127/17	
78-87-5	1,2-Dichloropropane	10 U	250	245	98	250	255	102	4	76-124/14	
10061-01-5	cis-1,3-Dichloropropene	10 U	250	224	90	250	236	94	5	75-118/23	
10061-02-6	trans-1,3-Dichloropropene	10 U	250	226	90	250	227	91	0	80-120/22	
100-41-4	Ethylbenzene	10 U	250	253	101	250	255	102	1	81-121/14	
76-13-1	Freon 113	10 U	250	243	97	250	249	100	2	72-134/20	
74-83-9	Methyl Bromide	20 U	250	195	78	250	200	80	3	59-143/19	
74-87-3	Methyl Chloride	20 U	250	217	87	250	228	91	5	50-159/19	
75-09-2	Methylene Chloride	50 U	250	264	106	250	259	104	2	69-135/16	
100-42-5	Styrene	10 U	250	267	107	250	270	108	1	78-119/23	
79-34-5	1,1,2,2-Tetrachloroethane	10 U	250	260	104	250	257	103	1	72-120/14	
127-18-4	Tetrachloroethylene	10 U	250	252	101	250	258	103	2	76-135/16	
108-88-3	Toluene	10 U	250	261	104	250	264	106	1	80-120/14	
71-55-6	1,1,1-Trichloroethane	10 U	250	249	100	250	246	98	1	75-130/16	
79-00-5	1,1,2-Trichloroethane	10 U	250	273	109	250	269	108	1	76-119/14	
79-01-6	Trichloroethylene	10 U	250	260	104	250	269	108	3	81-126/15	
75-69-4	Trichlorofluoromethane	20 U	250	267	107	250	258	103	3	71-156/21	
75-01-4	Vinyl Chloride	10 U	250	227	91	250	222	89	2	69-159/18	
m,p-Xylene		20 U	500	528	106	500	532	106	1	79-126/15	

\* = Outside of Control Limits.

6.3.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50526-4MS	J0988643.D	10	01/03/18	MM	n/a	n/a	VJ5793
FA50526-4MSD	J0988644.D	10	01/03/18	MM	n/a	n/a	VJ5793
FA50526-4	J0988641.D	10	01/03/18	MM	n/a	n/a	VJ5793

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	FA50526-4		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
95-47-6	o-Xylene	10	U	250	256	102	250	257	103	0	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50526-4	Limits
1868-53-7	Dibromofluoromethane	98%	100%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	100%	100%	109%	79-125%
2037-26-5	Toluene-D8	98%	100%	99%	85-112%
460-00-4	4-Bromofluorobenzene	97%	96%	96%	83-118%

\* = Outside of Control Limits.

6.3.1  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 2

**Job Number:** FA50605  
**Account:** UNIVAR Univar  
**Project:** ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50557-2MS	N0107874.D	10	01/04/18	WV	n/a	n/a	VN4929
FA50557-2MSD	N0107875.D	10	01/04/18	WV	n/a	n/a	VN4929
FA50557-2	N0107866.D	10	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

**Method:** SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	FA50557-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
107-02-8	Acrolein	ND		1250	888	71	1250	829	66	7	31-154/29
107-13-1	Acrylonitrile	ND		1250	1330	106	1250	1170	94	13	58-126/16
71-43-2	Benzene	ND		250	255	102	250	240	96	6	81-122/14
75-27-4	Bromodichloromethane	ND		250	256	102	250	245	98	4	79-123/19
75-25-2	Bromoform	ND		250	233	93	250	219	88	6	66-123/21
75-15-0	Carbon Disulfide	ND		250	209	84	250	204	82	2	66-148/23
56-23-5	Carbon Tetrachloride	ND		250	240	96	250	230	92	4	76-136/23
108-90-7	Chlorobenzene	ND		250	251	100	250	239	96	5	82-124/14
110-75-8	2-Chloroethyl Vinyl Ether	ND		1250	ND	0*	1250	ND	0*	nc	56-122/23
67-66-3	Chloroform	ND		250	254	102	250	241	96	5	80-124/15
124-48-1	Dibromochloromethane	ND		250	246	98	250	231	92	6	78-122/19
75-71-8	Dichlorodifluoromethane	ND		250	336	134	250	329	132	2	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		250	249	100	250	233	93	7	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		250	253	101	250	239	96	6	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		250	250	100	250	234	94	7	78-120/15
75-34-3	1,1-Dichloroethane	804		250	1030	90	250	991	75* a	4	81-122/15
107-06-2	1,2-Dichloroethane	4.5	J	250	267	105	250	244	96	9	75-125/14
75-35-4	1,1-Dichloroethylene	1010	E	250	1150	56* a	250	1110	40* a	4	78-137/18
156-59-2	cis-1,2-Dichloroethylene	ND		250	261	104	250	246	98	6	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		250	260	104	250	245	98	6	76-127/17
78-87-5	1,2-Dichloropropane	ND		250	255	102	250	240	96	6	76-124/14
10061-01-5	cis-1,3-Dichloropropene	ND		250	220	88	250	211	84	4	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		250	239	96	250	229	92	4	80-120/22
100-41-4	Ethylbenzene	ND		250	249	100	250	236	94	5	81-121/14
76-13-1	Freon 113	ND		250	230	92	250	223	89	3	72-134/20
74-83-9	Methyl Bromide	ND		250	294	118	250	284	114	3	59-143/19
74-87-3	Methyl Chloride	ND		250	282	113	250	265	106	6	50-159/19
75-09-2	Methylene Chloride	ND		250	268	107	250	254	102	5	69-135/16
100-42-5	Styrene	ND		250	245	98	250	234	94	5	78-119/23
79-34-5	1,1,2,2-Tetrachloroethane	ND		250	273	109	250	246	98	10	72-120/14
127-18-4	Tetrachloroethylene	ND		250	234	94	250	225	90	4	76-135/16
108-88-3	Toluene	ND		250	250	100	250	238	95	5	80-120/14
71-55-6	1,1,1-Trichloroethane	39.2		250	279	96	250	267	91	4	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		250	263	105	250	246	98	7	76-119/14
79-01-6	Trichloroethylene	3.9	J	250	266	105	250	250	98	6	81-126/15
75-69-4	Trichlorofluoromethane	ND		250	294	118	250	281	112	5	71-156/21

\* = Outside of Control Limits.

6.3.2  
6

# Matrix Spike/Matrix Spike Duplicate Summary

Page 2 of 2

Job Number: FA50605  
Account: UNIVAR Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA50557-2MS	N0107874.D	10	01/04/18	WV	n/a	n/a	VN4929
FA50557-2MSD	N0107875.D	10	01/04/18	WV	n/a	n/a	VN4929
FA50557-2	N0107866.D	10	01/04/18	WV	n/a	n/a	VN4929

The QC reported here applies to the following samples:

Method: SW846 8260B

FA50605-1, FA50605-2, FA50605-3

CAS No.	Compound	FA50557-2		Spike	MS	MS	Spike	MSD	MSD	RPD	Limits Rec/RPD
		ug/l	Q	ug/l	ug/l	%	ug/l	ug/l	%		
75-01-4	Vinyl Chloride	ND		250	267	107	250	260	104	3	69-159/18
	m,p-Xylene	ND		500	504	101	500	480	96	5	79-126/15
95-47-6	o-Xylene	ND		250	247	99	250	232	93	6	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA50557-2	Limits
1868-53-7	Dibromofluoromethane	102%	101%	102%	83-118%
17060-07-0	1,2-Dichloroethane-D4	103%	103%	100%	79-125%
2037-26-5	Toluene-D8	98%	98%	96%	85-112%
460-00-4	4-Bromofluorobenzene	98%	99%	99%	83-118%

(a) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

6.3.2  
6

**General Chemistry****QC Data Summaries**

7

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA50605  
Account: UNIVAR - Univar  
Project: ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Cyanide, Total	GP30930/GN77487	0.010	0.0	mg/l	0.1	0.105	105.0	90-110%
HEM Oil and Grease	GP30916/GN77450	5.0	0.0	mg/l	40.0	32.9	82.2	78-114%

Associated Samples:

Batch GP30916: FA50605-2  
Batch GP30930: FA50605-2  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA50605  
Account: UNIVAR - Univar  
Project: ERMORP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Cyanide, Total	GP30930/GN77487	FA50605-2	mg/l	0.0030 U	0.1	0.113	113.0*(a)	90-110%
HEM Oil and Grease	GP30916/GN77450	FA50525-2	mg/l	0.0	40.0	36.9	86.5	78-114%

Associated Samples:

Batch GP30916: FA50605-2

Batch GP30930: FA50605-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

(a) Spike recovery indicates possible matrix interference.

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: FA50605  
Account: UNIVAR - Univar  
Project: ERMOP: Water Treatment System Sampling; 3950 NW Yeon Ave, Portland, OR

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Cyanide, Total	GP30930/GN77487	FA50605-2	mg/l	0.0030 U	0.1	0.112	0.0	20%

Associated Samples:

Batch GP30930: FA50605-2

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

7.3  
7

# Memorandum

Environmental  
Resources  
Management

To: Tanya Battye

From: Rachel James

Date: 11 January 2018

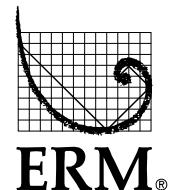
Subject: Data Review of Univar NW Yeon Water Treatment System Samples Collected 29 December 2017

Project Number: 0436528

---

**Data Packages:** SGS Accutest Data Package FA50605

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)  
[www.erm.com](http://www.erm.com)



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017 and *USEPA National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017.

## **HOLDING TIME AND PRESERVATION EVALUATION**

The sample shipments were received at the laboratory within the method-prescribed temperature preservation requirements of less than 6°C. The laboratory noted that samples W-1-20171229, W-2-20171229, and TRIP BLANK were not preserved to a pH of less than 2 for method 8260B. All three samples were analyzed within the shortened holding time of 7 days for unpreserved samples and qualifications were not necessary. Data associated with exceeded preservation requirements are listed in Table 1. Remaining samples were acceptably preserved and were prepared and analyzed within the method-prescribed time period from the date of collection.

## **BLANK EVALUATION**

The method and trip blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory or during shipment, handling, and storage.

## ***CONTINUING CALIBRATION VERIFICATION (CCV) EVALUATION***

The continuing calibration verification (CCV) recoveries were within the laboratory's limits of acceptance, with one exception. The CCV in batch VN4929 was recovered above the method 8260B laboratory limits for Acrolein. Acrolein was not detected in the associated samples and qualifications were not necessary due to the high CCV recovery. The CCV outlier is presented in Table 2.

## ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

## ***MATRIX SPIKE EVALUATION***

The matrix spike (MS)/matrix spike duplicate (MSD) recoveries and RPDs were within laboratory limits of acceptance with several exceptions. No data were qualified as the outliers were either from non-project samples or a high recovery was associated with a non-detect result. The outliers can be found in Table 3.

## ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

## ***CALIBRATION RANGE EXCEEDANCES***

The 1,1-dichloroethylene results for batch MS/MSD sample FA50557-2 exceeded the instrument calibration range as noted on Table 4. Since the MS/MSD parent sample is not from this project, no qualifications were applied.

### ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

### ***OVERALL ASSESSMENT***

No results were qualified or rejected. All of the data can be used for decision-making purposes. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

**Table 1**  
*Samples with Exceeded Preservation Requirements*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Analysis Method	Preservation Condition	Limits	ERM Qualifier
FA50605	W-1-20171229	8260B	pH > 2	pH < 2	--
	W-2-20171229				
	TRIP BLANK				

Lab report reviewed: FA50605

**Table 2**  
*Calibration Verification Recoveries Outside of Acceptable Limits*  
*Water Treatment Samples Collected at Univar NW Yeon Facility in December 2017*  
*Univar USA, Inc.*  
*Portland, Oregon*

Lab Package	Sample ID	Associated Sample	Compound	CCV Recovery	Reported Concentration	Units	ERM Qualifier
FA50605	CCV in batch VN4929	--	Acrolein	High	NR	%	--

Lab report reviewed: FA50605

**Key:**

CCV = Continuing calibration verification

High = CCV above maximum acceptable limit

NR = Not reported

**Table 3**  
*Spike Recoveries Outside of Acceptable Limits*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Spike Sample ID	Associated Sample	Compound	Recovery (%)	Limit (%)	RPD	RPD Limit	Result	Units	ERM Qualifier
MS/MSD										
FA50605	Batch QC	--	2-Chloroethyl Vinyl Ether	0/0	46-122	NC	23	--	--	--
		--	1,1-Dichloroethane	90/75	81-122	4	15	--	--	--
		--	1,1-Dichloroethylene	56/40	78-137	4	18	--	--	--
	W-2-20171229 MS/MSD	W-2-20171229	Total Cyanide	113/112	90-110	0	20	ND	mg/L	--

Lab report reviewed: FA50605

**Key:**

Batch = Spike sample was prepared using non-client sample

MS/MSD - Matrix spike/matrix spike duplicate

mg/L = Milligrams per liter

ND = Not detected

NC = Not calculated

RPD = Relative percent difference

**Table 4**  
*Calibration Range Exceedances*  
**Water Treatment Samples Collected at Univar NW Yeon Facility in December 2017**  
**Univar USA, Inc.**  
**Portland, Oregon**

Lab Package	Sample ID	Compound	Reported Concentration	Units	ERM Qualifier
FA50605	Batch MS/MSD Sample FA50557-2	1,1-Dichloroethylene	Sample: 1010 MS: 1150 MSD: 1110	µg/L	--

Lab report reviewed: FA50605

**Key:**

Batch = Spike sample was prepared using non-client sample

MS/MSD - Matrix spike/matrix spike duplicate

µg/L = Micrograms per liter



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2655 Park Center Dr., Suite A  
Simi Valley, CA 93065  
T: +1 805 526 7161  
F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

## LABORATORY REPORT

January 10, 2018

Brendan Robinson  
ERM West, Incorporated  
1001 SW 5th Ave, Suite 1010  
Portland, OR 97204

Dear Brendan:

Enclosed are the results of the sample submitted to our laboratory on January 3, 2018. For your reference, these analyses have been assigned our service request number P1800015.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

*Kate Kaneko*

By Kate Kaneko at 10:21 am, 01/10/18

Kate Kaneko  
Project Manager



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Simi Valley, CA 93065  
T: +1 805 526 7161  
F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

Client: ERM West, Incorporated

Service Request No: P1800015

## CASE NARRATIVE

The sample was received intact under chain of custody on January 3, 2018 and was stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the sample at the time of sample receipt.

### Volatile Organic Compound Analysis

The sample was analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The container was cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

---

*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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F: +1 805 526 7270  
[www.alsglobal.com](http://www.alsglobal.com)

## ALS Environmental – Simi Valley

### CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Arizona DHS	<a href="http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home">http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home</a>	AZ0694
Florida DOH (NELAP)	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E871020
Louisiana DEQ (NELAP)	<a href="http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx">http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx</a>	05071
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm">http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm</a>	2016036
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	1347317
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/oqa/">http://www.nj.gov/dep/oqa/</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-004
Pennsylvania DEP	<a href="http://www.depweb.state.pa.us/labs">http://www.depweb.state.pa.us/labs</a>	68-03307 (Registration)
PJLA (DoD ELAP)	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	65818 (Testing)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704413-17-8
Utah DOH (NELAP)	<a href="http://health.utah.gov/lab/environmental-lab-certification/">http://health.utah.gov/lab/environmental-lab-certification/</a>	CA01627201 7-8
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946
Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <a href="http://www.alsglobal.com">www.alsglobal.com</a> , or at the accreditation body's website.		
Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.		

**ALS ENVIRONMENTAL****DETAIL SUMMARY REPORT**

Client: ERM West, Incorporated

Service Request: P1800015

Date Received: 1/3/2018  
Time Received: 09:30

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
VSP-2-20171229	P1800015-001	Air	12/29/2017	08:25	SC00983	0.40	3.59	X



Univar USA Inc.  
Univar Environmental Affairs  
Tel 425/888-3715 Fax 425/888-4133

### Univar Chain of Custody/Laboratory Analysis Request Form

Page 1 of 1

Billed to:  
Mark Metcalf  
Univar USA  
17425 NE Union Hill Rd  
Redmond, WA 98052

Lab Name:	ALS P1800015
Address:	Sihi Valley
Telephone:	805-526-7161

#### REMARKS:

Invoice:	Date: 01Dec17	SHIPPING:	0.00
Customer:	Wgt: 6.20 LBS	SPECIAL:	0.00
Dept:	COD:	HANDLING:	0.00
PO Number:	DV:	TOTAL:	0.00

Svc: GND PPD RMGR  
TRCK: 405647963633

Univar Project Site:	PORTLAND, OR (NW 46th) Po <5074>
Contractor Project Manager:	BRENDAN ROBISON
Firm:	ERM
Address:	1001 SW 5th Ave, Suite 1010 Portland, OR 97204
Tel:	(503) 488-5282

Sampler's Signature:

SAMPLE I.D.	DATE	TIME	LAB ID.	MATRIX	SCANNING TO DESIGNER	SI	TO - 1					
VSP-2-20171229	12/29/17	08:05		Air	1	X						

Relinquished by/date:	11/29/17	Invoice Instructions – Univar to provide to Sampler (Circle codes. If multiple codes apply, note in Remarks)			SPECIAL INSTRUCTIONS & COMMENTS: Fax copy of lab results to Envir. Affairs Dept., 425/888-4133		
Received by/date:	Henry.Perry@93011-3-18	#153/163			EMAIL RESULTS TO: BRENDAN.ROBISON@ERM.COM DYLAN.STANKUS@ERM.COM		
Relinquished by/date:	/	Soil Investigation/Remediation 035, 133 or 058, 156					
Received by/date:	/	Water Investigation/Remediation 047, 146 or 165, 187					
Relinquished by/date:	/	Air-Gill Investigation or Remediation 034 or 057					
Received by/date:	/	Waste 171					

REPORT REQUIREMENTS: (circle) I. Routine Report II. Report III. Data Validation Report IV. GLP Deliverable Report

//Requested Report Date: \_\_\_\_\_

TURNAROUND TIME: 24 hr    48 hr    X 6 day    Standard (7-10 working days)    Provide Verbal Prelim. Results    Fax Prelim. Results

**ALS Environmental  
Sample Acceptance Check Form**

Client: ERM West, Incorporated

Work order: P1800015

## Project:

Sample(s) received on: 1/3/18

Date opened: 1/3/18

by: E.PEREZ

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		<u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were <b>sample containers</b> properly marked with client sample ID?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Did <b>sample containers</b> arrive in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Were <b>chain-of-custody</b> papers used and filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Did <b>sample container labels</b> and/or tags agree with custody papers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Was <b>sample volume</b> received adequate for analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Are samples within specified holding times?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Were <b>custody seals</b> on outside of cooler/Box/Container? Location of seal(s)? _____ Sealing Lid?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Were signature and date included?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Were seals intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? Is there a client indication that the submitted samples are <b>pH</b> preserved? Were <b>VOA vials</b> checked for presence/absence of air bubbles?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<b>Tubes:</b> Are the tubes capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	<b>Badges:</b> Are the badges properly capped and intact? Are dual bed badges separated and individually capped and intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Explain any discrepancies: (include lab sample ID numbers):

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171229

ALS Project ID: P1800015  
 ALS Sample ID: P1800015-001

Test Code:	EPA TO-15	Date Collected:	12/29/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	1/3/18
Analyst:	Anusha Bayyarapu	Date Analyzed:	1/4/18
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:			0.0080 Liter(s)
Container ID:	SC00983		

Initial Pressure (psig): 0.40      Final Pressure (psig): 3.59

Container Dilution Factor: 1.21

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	40	ND	20	
75-01-4	Vinyl Chloride	<b>76</b>	40	<b>30</b>	16	
74-83-9	Bromomethane	ND	40	ND	10	
75-00-3	Chloroethane	ND	40	ND	15	
67-64-1	Acetone	ND	400	ND	170	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	40	ND	7.2	
75-35-4	1,1-Dichloroethene	<b>350</b>	40	<b>89</b>	10	
75-09-2	Methylene Chloride	ND	40	ND	12	
76-13-1	Trichlorotrifluoroethane (CFC 113)	<b>140</b>	40	<b>19</b>	5.3	
75-15-0	Carbon Disulfide	ND	400	ND	130	
156-60-5	trans-1,2-Dichloroethene	<b>150</b>	40	<b>37</b>	10	
75-34-3	1,1-Dichloroethane	<b>670</b>	40	<b>170</b>	10	
1634-04-4	Methyl tert-Butyl Ether	ND	40	ND	11	
108-05-4	Vinyl Acetate	ND	400	ND	110	
78-93-3	2-Butanone (MEK)	ND	400	ND	140	
156-59-2	cis-1,2-Dichloroethene	<b>8,200</b>	76	<b>2,100</b>	19	<b>D</b>
67-66-3	Chloroform	ND	40	ND	8.3	
107-06-2	1,2-Dichloroethane	ND	40	ND	10	
71-55-6	1,1,1-Trichloroethane	<b>6,200</b>	76	<b>1,100</b>	14	<b>D</b>
71-43-2	Benzene	ND	40	ND	13	
56-23-5	Carbon Tetrachloride	ND	40	ND	6.4	
78-87-5	1,2-Dichloropropane	ND	40	ND	8.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** VSP-2-20171229

ALS Project ID: P1800015  
 ALS Sample ID: P1800015-001

Test Code:	EPA TO-15	Date Collected:	12/29/17
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	1/3/18
Analyst:	Anusha Bayyarapu	Date Analyzed:	1/4/18
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.015 Liter(s)
Test Notes:			0.0080 Liter(s)
Container ID:	SC00983		

Initial Pressure (psig): 0.40      Final Pressure (psig): 3.59

Container Dilution Factor: 1.21

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	40	ND	6.0	
79-01-6	Trichloroethene	<b>5,800</b>	40	<b>1,100</b>	7.5	
10061-01-5	cis-1,3-Dichloropropene	ND	40	ND	8.9	
108-10-1	4-Methyl-2-pentanone	ND	40	ND	9.8	
10061-02-6	trans-1,3-Dichloropropene	ND	40	ND	8.9	
79-00-5	1,1,2-Trichloroethane	ND	40	ND	7.4	
108-88-3	Toluene	<b>130</b>	40	<b>34</b>	11	
591-78-6	2-Hexanone	ND	40	ND	9.8	
124-48-1	Dibromochloromethane	ND	40	ND	4.7	
106-93-4	1,2-Dibromoethane	ND	40	ND	5.3	
127-18-4	Tetrachloroethene	<b>12,000</b>	76	<b>1,700</b>	11	<b>D</b>
108-90-7	Chlorobenzene	ND	40	ND	8.8	
100-41-4	Ethylbenzene	ND	40	ND	9.3	
179601-23-1	m,p-Xylenes	ND	81	ND	19	
75-25-2	Bromoform	ND	40	ND	3.9	
100-42-5	Styrene	ND	40	ND	9.5	
95-47-6	o-Xylene	ND	40	ND	9.3	
79-34-5	1,1,2,2-Tetrachloroethane	ND	40	ND	5.9	
541-73-1	1,3-Dichlorobenzene	ND	40	ND	6.7	
106-46-7	1,4-Dichlorobenzene	ND	40	ND	6.7	
95-50-1	1,2-Dichlorobenzene	ND	40	ND	6.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

ALS Project ID: P1800015

ALS Sample ID: P180104-MB

Test Code:	EPA TO-15	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	NA
Analyst:	Anusha Bayyaparu	Date Analyzed:	1/4/18
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	1.00 Liter(s)
Test Notes:			

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
74-87-3	Chloromethane	ND	0.50	ND	0.24	
75-01-4	Vinyl Chloride	ND	0.50	ND	0.20	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.50	ND	0.19	
67-64-1	Acetone	ND	5.0	ND	2.1	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.50	ND	0.089	
75-35-4	1,1-Dichloroethene	ND	0.50	ND	0.13	
75-09-2	Methylene Chloride	ND	0.50	ND	0.14	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.50	ND	0.065	
75-15-0	Carbon Disulfide	ND	5.0	ND	1.6	
156-60-5	trans-1,2-Dichloroethene	ND	0.50	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.50	ND	0.12	
1634-04-4	Methyl tert-Butyl Ether	ND	0.50	ND	0.14	
108-05-4	Vinyl Acetate	ND	5.0	ND	1.4	
78-93-3	2-Butanone (MEK)	ND	5.0	ND	1.7	
156-59-2	cis-1,2-Dichloroethene	ND	0.50	ND	0.13	
67-66-3	Chloroform	ND	0.50	ND	0.10	
107-06-2	1,2-Dichloroethane	ND	0.50	ND	0.12	
71-55-6	1,1,1-Trichloroethane	ND	0.50	ND	0.092	
71-43-2	Benzene	ND	0.50	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.50	ND	0.080	
78-87-5	1,2-Dichloropropane	ND	0.50	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Method Blank

ALS Project ID: P1800015

ALS Sample ID: P180104-MB

Test Code: EPA TO-15

Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8

Date Received: NA

Analyst: Anusha Bayyarapu

Date Analyzed: 1/4/18

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
75-27-4	Bromodichloromethane	ND	0.50	ND	0.075	
79-01-6	Trichloroethene	ND	0.50	ND	0.093	
10061-01-5	cis-1,3-Dichloropropene	ND	0.50	ND	0.11	
108-10-1	4-Methyl-2-pentanone	ND	0.50	ND	0.12	
10061-02-6	trans-1,3-Dichloropropene	ND	0.50	ND	0.11	
79-00-5	1,1,2-Trichloroethane	ND	0.50	ND	0.092	
108-88-3	Toluene	ND	0.50	ND	0.13	
591-78-6	2-Hexanone	ND	0.50	ND	0.12	
124-48-1	Dibromochloromethane	ND	0.50	ND	0.059	
106-93-4	1,2-Dibromoethane	ND	0.50	ND	0.065	
127-18-4	Tetrachloroethene	ND	0.50	ND	0.074	
108-90-7	Chlorobenzene	ND	0.50	ND	0.11	
100-41-4	Ethylbenzene	ND	0.50	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.0	ND	0.23	
75-25-2	Bromoform	ND	0.50	ND	0.048	
100-42-5	Styrene	ND	0.50	ND	0.12	
95-47-6	o-Xylene	ND	0.50	ND	0.12	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.50	ND	0.073	
541-73-1	1,3-Dichlorobenzene	ND	0.50	ND	0.083	
106-46-7	1,4-Dichlorobenzene	ND	0.50	ND	0.083	
95-50-1	1,2-Dichlorobenzene	ND	0.50	ND	0.083	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

**Client:** **ERM West, Incorporated**

ALS Project ID: P1800015

Test Code: EPA TO-15  
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8  
Analyst: Anusha Bayyarapu  
Sample Type: 6.0 L Summa Canister(s)  
Test Notes:

Date(s) Collected: 12/29/17

Date(s) Received: 1/3/18

Date(s) Analyzed: 1/4/18

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P180104-MB	103	101	102	70-130	
Lab Control Sample	P180104-LCS	99	99	103	70-130	
VSP-2-20171229	P1800015-001	101	98	102	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 2

**Client:** ERM West, Incorporated  
**Client Sample ID:** Lab Control Sample

ALS Project ID: P1800015  
 ALS Sample ID: P180104-LCS

Test Code:	EPA TO-15	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	NA
Analyst:	Anusha Bayyarapu	Date Analyzed:	1/4/18
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.125 Liter(s)
Test Notes:			

CAS #	Compound	Spike Amount µg/m³	ALS		
			Result µg/m³	% Recovery	Acceptance Limits
74-87-3	Chloromethane	210	186	89	47-140
75-01-4	Vinyl Chloride	211	193	91	63-127
74-83-9	Bromomethane	210	198	94	63-132
75-00-3	Chloroethane	210	186	89	68-129
67-64-1	Acetone	1,050	944	90	63-124
75-69-4	Trichlorofluoromethane (CFC 11)	208	185	89	65-113
75-35-4	1,1-Dichloroethene	213	192	90	72-118
75-09-2	Methylene Chloride	213	176	83	67-116
76-13-1	Trichlorotrifluoroethane (CFC 113)	214	189	88	68-113
75-15-0	Carbon Disulfide	214	178	83	68-120
156-60-5	trans-1,2-Dichloroethene	214	200	93	71-125
75-34-3	1,1-Dichloroethane	212	178	84	68-118
1634-04-4	Methyl tert-Butyl Ether	213	180	85	60-123
108-05-4	Vinyl Acetate	1,060	978	92	73-135
78-93-3	2-Butanone (MEK)	212	183	86	70-129
156-59-2	cis-1,2-Dichloroethene	212	187	88	69-121
67-66-3	Chloroform	212	185	87	69-113
107-06-2	1,2-Dichloroethane	212	188	89	62-120
71-55-6	1,1,1-Trichloroethane	212	205	97	65-116
71-43-2	Benzene	213	180	85	66-111
56-23-5	Carbon Tetrachloride	214	213	100	64-122
78-87-5	1,2-Dichloropropane	212	184	87	69-121

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.  
 Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 2 of 2

**Client:** ERM West, Incorporated

**Client Sample ID:** Lab Control Sample

ALS Project ID: P1800015

ALS Sample ID: P180104-LCS

Test Code:	EPA TO-15	Date Collected:	NA
Instrument ID:	Tekmar AUTOCAN/Agilent 5973inert/6890N/MS8	Date Received:	NA
Analyst:	Anusha Bayyarapu	Date Analyzed:	1/4/18
Sample Type:	6.0 L Summa Canister	Volume(s) Analyzed:	0.125 Liter(s)
Test Notes:			

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS	
					Acceptance Limits	Data Qualifier
75-27-4	Bromodichloromethane	214	212	99	69-123	
79-01-6	Trichloroethene	212	192	91	69-112	
10061-01-5	cis-1,3-Dichloropropene	208	210	101	74-129	
108-10-1	4-Methyl-2-pentanone	213	195	92	66-138	
10061-02-6	trans-1,3-Dichloropropene	213	230	108	75-130	
79-00-5	1,1,2-Trichloroethane	212	204	96	73-117	
108-88-3	Toluene	211	183	87	66-114	
591-78-6	2-Hexanone	211	189	90	58-146	
124-48-1	Dibromochloromethane	212	219	103	67-130	
106-93-4	1,2-Dibromoethane	211	207	98	70-127	
127-18-4	Tetrachloroethene	212	193	91	62-119	
108-90-7	Chlorobenzene	212	190	90	66-115	
100-41-4	Ethylbenzene	212	192	91	69-117	
179601-23-1	m,p-Xylenes	424	384	91	67-117	
75-25-2	Bromoform	212	236	111	67-135	
100-42-5	Styrene	211	212	100	70-128	
95-47-6	o-Xylene	211	193	91	67-118	
79-34-5	1,1,2,2-Tetrachloroethane	212	200	94	70-125	
541-73-1	1,3-Dichlorobenzene	212	203	96	70-124	
106-46-7	1,4-Dichlorobenzene	214	201	94	63-124	
95-50-1	1,2-Dichlorobenzene	214	205	96	66-125	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.

Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

# Memorandum

Environmental  
Resources  
Management

To: Tanya Battye

From: Rachel James

Date: 12 January 2017

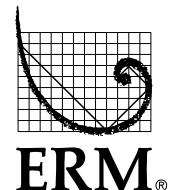
Subject: Data Review of Univar NW Yeon Soil Vapor Extraction Samples Collected 29 December 2017

Project Number: 0436528

Data Package: ALS Data Package P1800015

---

1001 SW 5<sup>th</sup> Avenue,  
Suite 1010  
Portland, OR 97204  
(503) 488-5282  
(503) 488-5124 (fax)



The data quality was assessed and any necessary qualifiers were applied following the *USEPA National Functional Guidelines for Organic Superfund Methods Data Review*, January 2017.

## ***HOLDING TIME AND PRESERVATION EVALUATION***

The samples were prepared and analyzed within the method-prescribed time period from the date of collection. The sample shipments were received at the laboratory within the method-prescribed temperature and preservation requirements. None of the data were qualified based on holding time or preservation exceedances.

## ***CANISTER VACUUM EVALUATION***

The laboratory noted that the summa canister for sample VSP-2-20171229 was received at ambient pressure. The results for this sample are considered estimates (J/UJ). The qualified data is presented in Table 1.

## ***BLANK EVALUATION***

The method blank sample results were nondetected for each of the target analytes. No data were qualified on the basis of the blank evaluation. The blank results indicate that no contaminants were introduced to the samples during processing or analysis in the laboratory.

### ***BLANK SPIKE EVALUATION***

The laboratory control sample (LCS) recoveries were within the laboratory's limits of acceptance. The LCS recoveries indicate acceptable laboratory accuracy.

### ***MATRIX SPIKE EVALUATION***

Matrix spikes are not performed for air samples.

### ***SURROGATE SPIKE EVALUATION***

The surrogate recoveries were within acceptable limits. No qualifications were required based on surrogate recoveries. The surrogate recoveries indicate minimal matrix interference in the samples.

### ***FIELD DUPLICATE EVALUATION***

No field duplicates were submitted.

### ***OVERALL ASSESSMENT***

None of the data required rejection. All of the data, including qualified data, can be used for decision-making purposes; however, the limitations indicated by the applied qualifiers should be considered when using the data. The quality of the data generated during this investigation is acceptable for the preparation of technically defensible documents.

***Table 1***  
***Canister Vacuum Discrepancies***  
***Soil Vapor Extraction Samples Collected 29 December 2017***  
***Univar USA, Inc.***  
***Portland, Oregon***

Lab Package	Sample ID	Method	Pressure At Receipt	Units	ERM Qualifier
P1800015	VSP-2-20171229	TO-15	0.40	psi	J/UJ

Lab report reviewed: P1800015

**Key:**

psi = Pounds per square inch

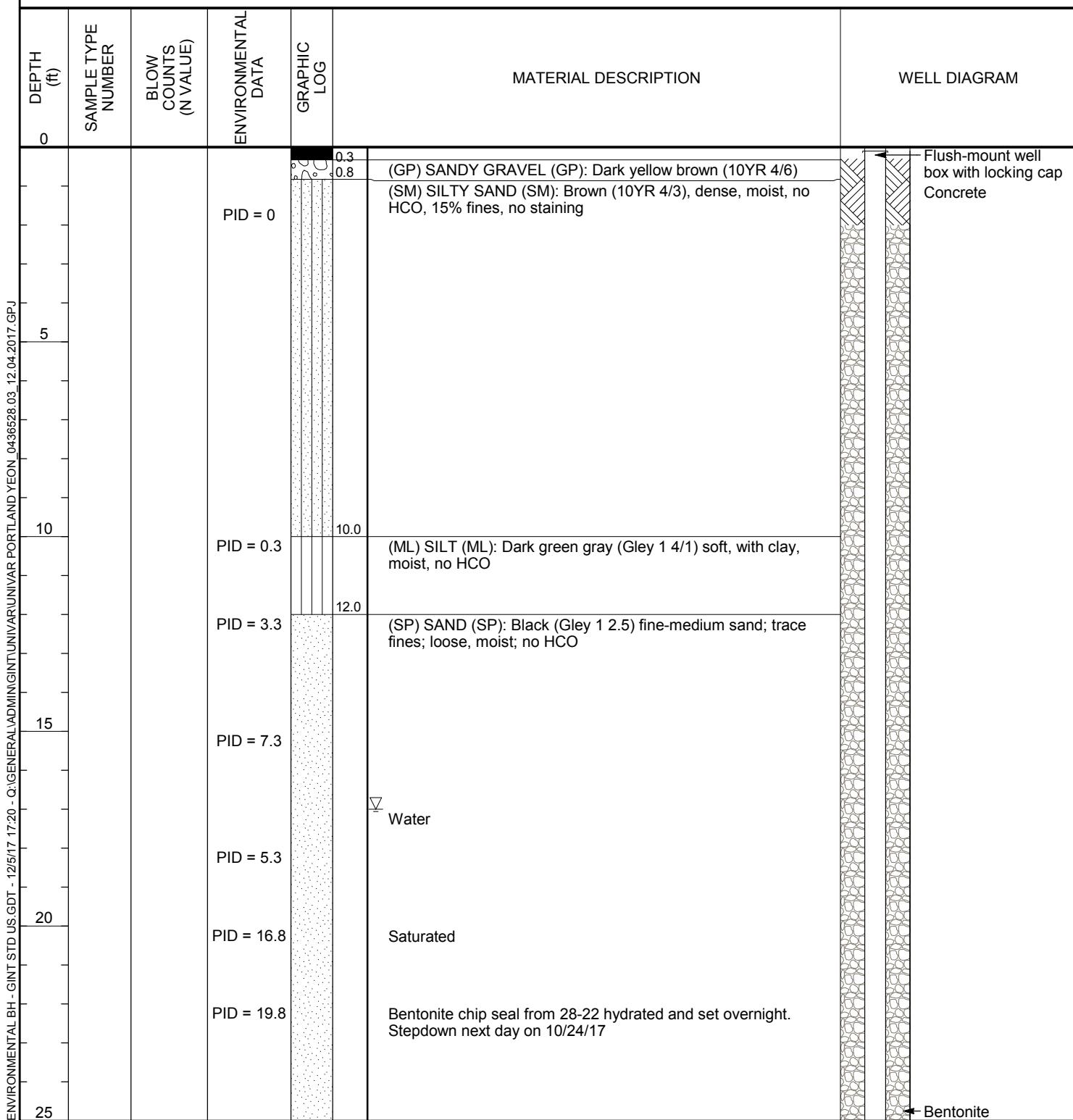
J/UJ = Detected results are estimated; nondetected results are estimated at the report limit

*Appendix D*  
*Well Logs*



ERM-West, Inc.  
1001 S.W. 5th Avenue, Suite 1010  
Portland, Oregon 97204  
Telephone: 503-488-5282

**CLIENT** Univar USA Inc. **PROJECT NAME** Monitoring Well Installation  
**PROJECT NUMBER** 0436528 **PROJECT LOCATION** Yeon  
**DATE STARTED** 10/23/17 **COMPLETED** 10/24/17 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 8"/6"  
**CONTRACTOR** Cascade Drilling **GROUND WATER LEVELS:**  
**EQUIPMENT** Sonic  **AT TIME OF DRILLING** 17.00 ft  
**LOGGED BY** J. Dauphinais **CHECKED BY** O. Rudloff  **AT END OF DRILLING** ---  
**NOTES**  **AFTER DRILLING** 31.00 ft



(Continued Next Page)



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Portland, Oregon 97204  
Telephone: 503-488-5282

**DMW-08**

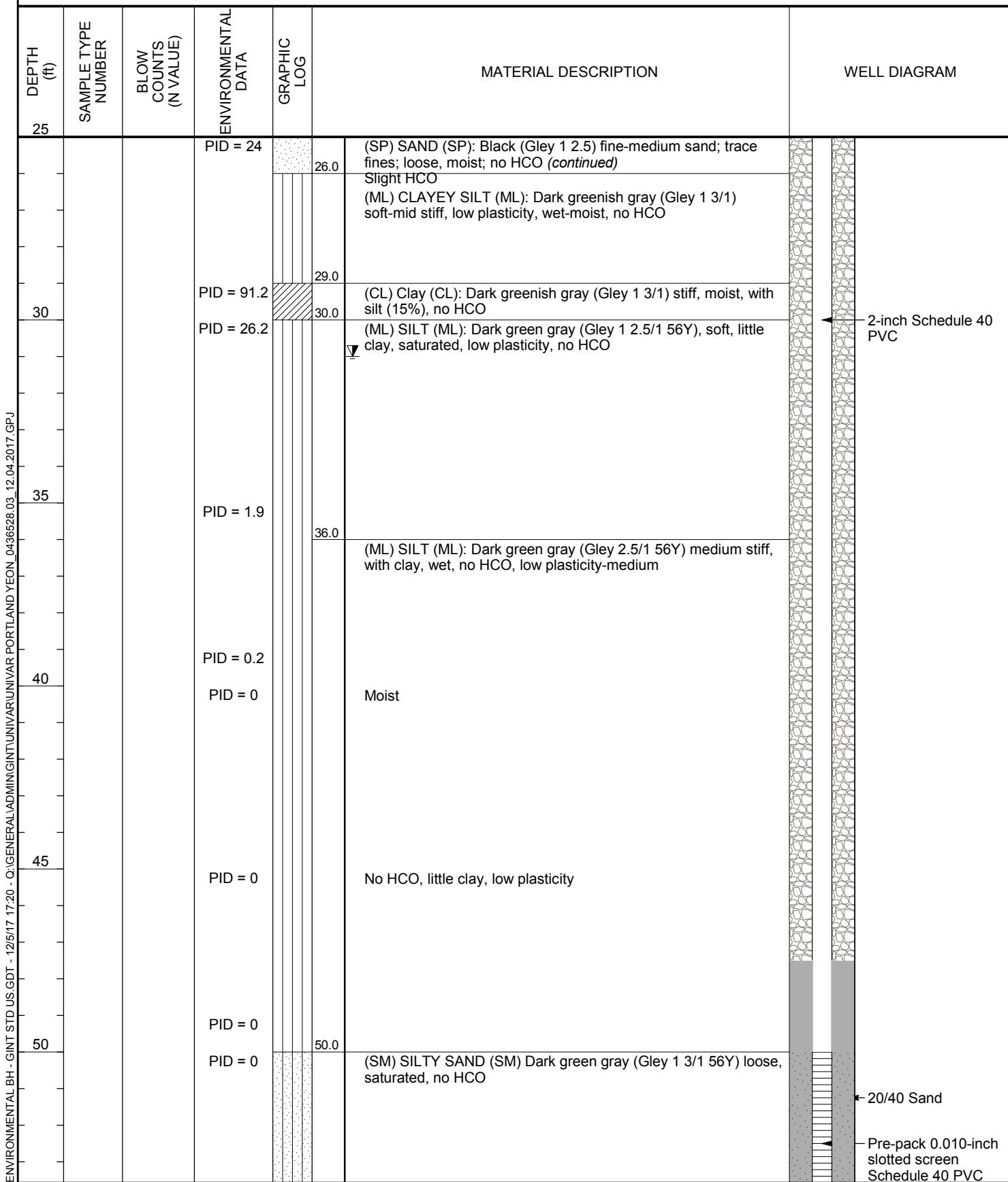
PAGE 2 OF 3

CLIENT Univar USA Inc.

PROJECT NAME Monitoring Well Installation

PROJECT NUMBER 0436528

PROJECT LOCATION Yeon



(Continued Next Page)



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Portland, Oregon 97204  
Telephone: 503-488-5282

**DMW-08**

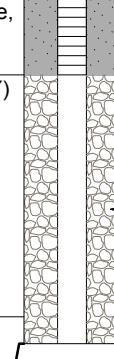
PAGE 3 OF 3

CLIENT Univar USA Inc.

PROJECT NAME Monitoring Well Installation

PROJECT NUMBER 0436528

PROJECT LOCATION Yeon

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
55			PID = 0		(SM) SILTY SAND (SM) Dark green gray (Gley 1 3/1 56Y) loose, saturated, no HCO (continued)  (ML) SILT WITH SAND (ML): Very dark green gray (Gley 1 10Y) soft, moist, no HCO, low plasticity	
60			PID = 0		(CL) SILTY CLAY (CL): Very dark green gray (Gley 1 3/1 10Y) stiff, medium plasticity, moist, no HCO	

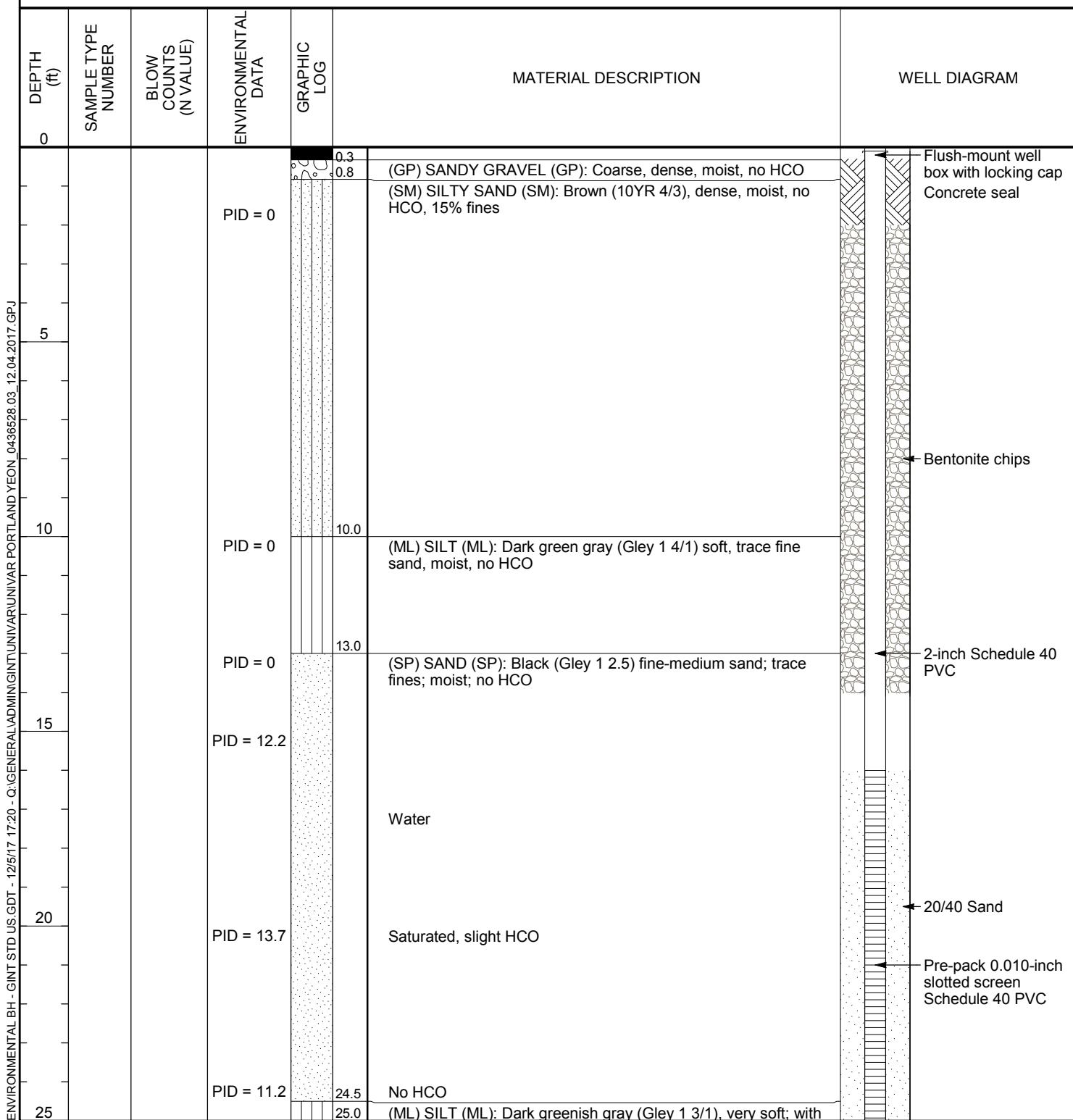
Bottom of borehole at 60.0 feet.



ERM-West, Inc.  
1001 S.W. 5th Avenue, Suite 1010  
Portland, Oregon 97204  
Telephone: 503-488-5282

**SMW-40**  
PAGE 1 OF 2

**CLIENT** Univar USA Inc.      **PROJECT NAME** Monitoring Well Installation  
**PROJECT NUMBER** 0436528      **PROJECT LOCATION** Yeon  
**DATE STARTED** 10/23/17      **COMPLETED** 10/24/17      **GROUND ELEVATION** \_\_\_\_\_      **HOLE SIZE** 2"  
**CONTRACTOR** Cascade Drilling      **GROUND WATER LEVELS:**  
**EQUIPMENT** Sonic      **AT TIME OF DRILLING** ---  
**LOGGED BY** J. Dauphinais      **CHECKED BY** O. Rudloff      **AT END OF DRILLING** ---  
**NOTES** \_\_\_\_\_      **AFTER DRILLING** ---



(Continued Next Page)



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1001 S.W. 5th Avenue, Suite 1010  
Portland, Oregon 97204  
Telephone: 503-488-5282

**SMW-40**

PAGE 2 OF 2

CLIENT Univar USA Inc.

PROJECT NAME Monitoring Well Installation

PROJECT NUMBER 0436528

PROJECT LOCATION Yeon

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
25					clay, fine sand, 25% saturated, no HCO, low plasticity (ML) SILT (ML) Dark green gray (Gley 1 3/1), soft, trace fines, no HCO	

Bottom of borehole at 26.0 feet.